Exchange Rates and Industrial Wage Inequality in Open Economies

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Abstract: We show that movements in exchange rates are a principal determinant of movements in industrial pay inequality – and therefore also in household income inequality – in open economies with floating exchange rates. We demonstrate this for a wide selection of countries for the years from 1971 to 2011, a period characterized by fluctuating exchange rates and financial market liberalization in many open economies. Exchange rates are related to the domestic pay distribution by the simple fact that export and non-export sectors are affected differently by devaluations: the home-currency revenue in export-oriented sectors rises automatically while the home-currency revenue in other sectors does not. Given the recent large devaluations in Latin America, Asia and elsewhere, we expect increases in inequality to be observed in the data for 2015 and 2016.

Key Words: Inequality, Exchange Rates,

JEL Code:

I. Introduction

This paper compares the movement of inter-industrial pay inequality with exchange rates measured against the U.S. dollar for a substantial set of countries. We find that there has been a strong association between the movement of pay inequality and exchange rates after open economies liberalize their financial sectors and allow for floating exchange rates. In practically all cases, currency devaluations are accompanied by a rise in inequality levels, and currency revaluations are associated with falling pay inequality. Further, since cross-sector industrial pay inequality is an important determinant of household income inequality, it follows that the simple mechanics of exchange rate determination have an important, and in many cases dominating, influence on household income inequalities.

This finding marks a departure from the prevailing literature on the evolution of inequalities, which has emphasized such difficult-to-measure factors as the evolution of technology, the progress of education, and the prevalence of international trade. It complements and advances the previous work of the University of Texas Inequality Project, which has identified common transnational patterns in the movement of inequalities without, up to now, having been able to specify the transmission mechanism. The evidence presented here suggests a very clear transmission mechanism and an unmistakable arrow of causation, running from movements of the exchange rate, to changes in intersectoral industrial pay inequality, and from there to changes in household income inequality. Our estimates suggest that for countries with open economies and floating exchange rates, substantial changes in the dollar exchange rate can have a dominating effect on the movement of gross household income inequalities in the short run.

Section II explains the relationship between exchange rates and industrial pay inequalities, and that between industrial pay inequalities and gross household income inequality. Section III introduces our data sources and the selection of countries analyzed so far. Section IV presents the evidence, mainly in graphical format; it is sufficiently compelling in that descriptive form alone. Section V presents estimates of the sensitivity of industrial pay inequality to changes in exchange rates. Section VI presents conclusions and some policy implications for global economy and financial markets.

II. Open Economies, Exchange Rates and Inequality

The 1944 Bretton Woods conference established an international monetary system that pegged western currencies to the dollar, which in turn was fixed to gold. Fixed-but-adjustable exchange rates, supported and managed by the International Monetary Fund, were intended to foster financial stability, to prevent competitive devaluations, and to permit autonomous economic policy aimed at promoting full employment and fostering economic growth.

The collapse of the Bretton Woods system in 1971 entailed the end of fixed exchange rates as a general principle, and the major western economies subsequently allowed their exchange

rates to float. Twenty years later, the fall of the Soviet Bloc in 1991 led to the introduction of many more countries into the international financial system, and to their adoption also of floating exchange rates.

In open economies, exchange rates have a simple, powerful effect on the distribution of pay across industrial sectors. Consider that in all cases, industries either produce primarily for the domestic market or primarily for export. Therefore when a country devalues or revalues, export and non-export sectors feel different effects. In the export sector, in the case of devaluation, the home-currency revenue rises instantly, for the simple reason that the foreign revenue – which does not change – translates into more local currency. This occurs instantly, and does not depend on any changes in volume. In the non-export sector, there is no such effect. Those who are paid in the local currency continue to be paid exactly what they earned before; any adjustments to offset an increased cost-of-living will come later if they come at all.

Consider further that in the overwhelming majority of cases, countries export from their most-advanced, best-paid sectors. Therefore, the increase in home-currency revenue following a devaluation produces greater inequality across sectors. The increased revenue in the better-paid sectors has to be paid out somewhere, even if only to the better-paid elements within the sector. Whatever the internal (within-sector) distribution of the increased revenue may be, some of it invariably will be recorded as increased pay and income in the sector.

Further, if the non-export sector relies on imported goods, such as food or fuel, it may suffer a decline in its profitability and a squeeze on its intrasectoral pay. Again, the squeeze will have to be recorded somewhere, reducing the relative position of the non-export sectors.

This simple mechanism works automatically. It does not require any change in patterns of demand or volumes of trade. And it works essentially at once; it does not require any lag.

Think for example of a worker in the automobile industry of Canada, an exporter trading mainly with the U.S.. Think also of a schoolteacher in North Bay or Prince George. After the 2008 crisis and the collapse of oil prices, the Canadian dollar depreciated. Thus, the automobile industry experienced increased sales in Canadian dollars, even assuming constant volume, and automobile sector incomes would have to reflect this increase somewhere. Meanwhile, the income of the schoolteacher remains constant. Thus, we expect an increase in inequalities in Canada from this effect.

Or consider the worker in glass or sulphur in Mexico and the taxi driver in Tijuana or Monterrey. Assume the Mexican peso devalues. The glass and sulphur industries experience rising peso incomes, some of which are paid to executives, engineers, and even perhaps to ordinary workers to compensate them from the decline in their real wage. These are reflected in the relative pay of these relatively-well-paid sectors. At the same time, the peso income of the taxi drivers is unchanged. Again, inequality rises. Movements in exchange rates are thus related to inter-industrial inequality levels in a simple mechanical fashion.

The University of Texas Inequality Project has also shown that changes in inter-industrial pay inequality correlate very closely with changes in gross household income inequality. The UTIP Estimated Household Income Inequality (EHII) is a global dataset built largely on this econometric relationship (Galbraith and Kum, 2005, Galbraith et al. 2014). Repeated estimates show that the ratio of changes in a Theil measure of industrial pay inequality to changes in gross household income inequality is on the order of 10:1 – that a change of ten percentage points in the industrial pay inequality measures will yield a change of one percent on a Gini index of household income inequality before taxes. This reflects the greater volatility of the intersectoral measure of industrial pay inequality, and the fact that variations in relative pay across industrial sectors are a major driver of differences in the income of households working within those sectors, or in other sectors whose pay is related to the relative pay of particular industries.

Therefore, if the movement of exchange rates is a strong factor explaining the movements of inter-industrial pay inequality, it can also help to explain the movement of household income inequality in open economies with floating exchange rates.

III. Data Sources and Country Selection

The University of Texas Inequality Project (UTIP) produces a global pay inequality data set, based on the Industrial Statistics database published annually by the United Nations Industrial Development Organization (UNIDO). The UTIP-UNIDO data set measures inequality using between groups component of the Theil's T statistic, measured across industrial sectors, for 167 countries over the period 1963-2008 (Galbraith, Halbach, Malinowska, Shams, and Zhang, 2014). For this paper, we updated the dataset through 2011, where data were available, for the countries under study.

The equation below summarizes the Theil's T statistic for a given country and year. p_i is the number of employees of a sector i over the total employment in the country. w_i is the average pay in the sector, and $\overline{w}$ is the average pay for all jobs in the country. Thus, intersectoral wage inequality is a function of the relative size of each sector and their average wage, relative to the average wage for the population as a whole.

$$T \quad = \sum_{i=1}^{g} p_i \frac{w_i}{\overline{w}} ln\left(\frac{w_i}{\overline{w}}\right)$$

As noted above, the UTIP-UNIDO data set is the basis for the Estimated Household Income Inequality (EHII) dataset. EHII is a comprehensive and consistently adjusted data set that presents measures of gross household income inequality, now covering 149 countries for the years 1963-2008 (Galbraith and Kum, 2005; Galbraith, Choi, Halbach, Malinowska, and Zhang, 2015).

The International Monetary Fund reports data on exchange rates relative to the USD on average per year. The period analyzed here is 1971 to 2011. The 1971 threshold was chosen to reflect the end of the Bretton Woods system, as discussed above (IMF, 2016).

The thirteen countries presented here are open economies that adopted a floating exchange rate following the end of either the Bretton Woods system or the collapse of the Soviet Bloc, or countries that undertook this reform during the 1990s. Hence, the time period of examination differs slightly for each country. We present time series for the two variables, scatterplots and correlation coefficients. Appendix I provides data on twenty-three additional countries for which a relationship between exchange rates and inequality is also apparent.

Table 1: Correlation Coefficients between Pay Inequality and Exchange Rates

Country	Years	Corr. Coef
Australia	1973-2011	0.7839
Singapore	1971-2011	0.8137
Canada	1971-2011	0.8034
Chile	1973-2011	0.686
Mexico	1994-2011	0.9443
Croatia	1992-2011	0.7293
Hungary	1971-2011	0.9262
Poland	1991-2011	0.8587
Romania	1991-2011	0.9341
India	1991-2011	0.7665
Russia	1993-2011	-0.1805
South Africa	1999-2011	0.0917
U.K.	1971-2011	0.5264

As Table 1 shows, with the sole exceptions of Russia and South Africa, the correlation between USD exchange rate movements and movements of industrial pay inequalities is very high. It is the highest in Mexico after 1994, which should surprise no one. But values are also very high for the East European countries, and they are entirely respectable in other parts of the world, including for example India, a vast country which has only minor direct trade with the United States. Section IV takes up the cases.

IV. Findings

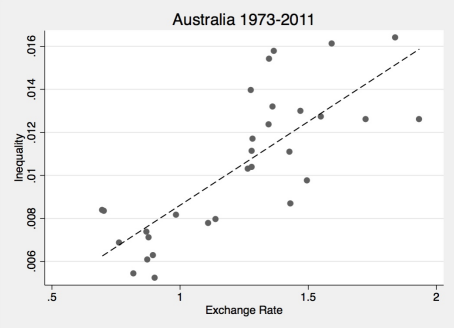
Australia and Singapore

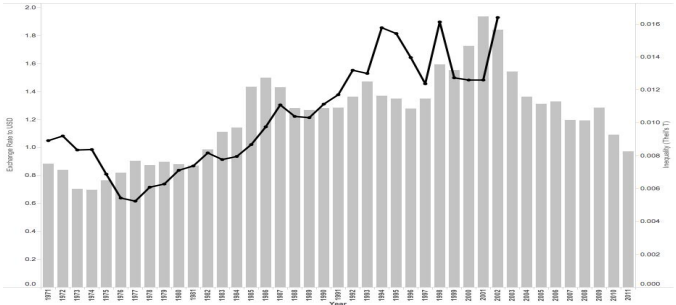
Australia implemented a successful model of trade protectionism and promotion of its agricultural exports until 1970. The subsequent decrease of international commodities prices at that time forced the country into a process of structural reforms that started in 1973. One drastic measure was a 25% cut in all tariffs. The 1980s "had also seen the floating of the Australian dollar (facilitating subsequent adjustment to tariff liberalization) followed by significant liberalization of the finance sector, including the removal of exchange and interest rate controls." (Banks, 2004)

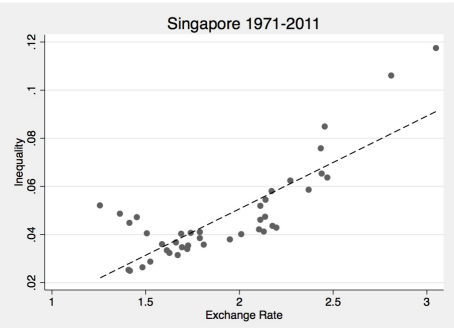
These policy decisions explain why the exchange rate movements correspond more closely with changes in inequality levels after 1973. In 1993, inflation targeting was introduced along with a floating exchange rate governed by the Reserve Bank of Australia.

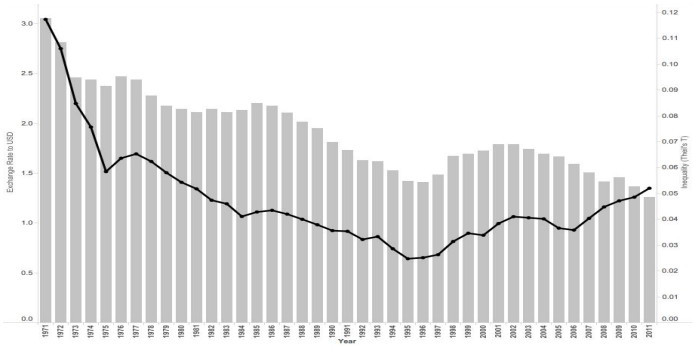
Singapore is an example of a small and rich open economy, with one of the highest levels of GDP per capita in the world. Singapore has the highest trade-to-GDP ratio in the world and receives large amounts of Foreign Direct Investment (FDI) (World Trade Organization, 2016).

The Monetary Authority of Singapore (MAS) was established in 1971 and since 1980 there has been a policy of management of the exchange rate. This policy prevented the country from exhibiting large jumps in its exchange rate from 1971 to 2011. Moreover, due the growing position of Singapore in the international markets, its national currency appreciated until 1996, with a simultaneous reduction in industrial pay inequality. In tandem with the Asian financial crisis, Singapore's currency devalued and inequality trends shifted after 1996.



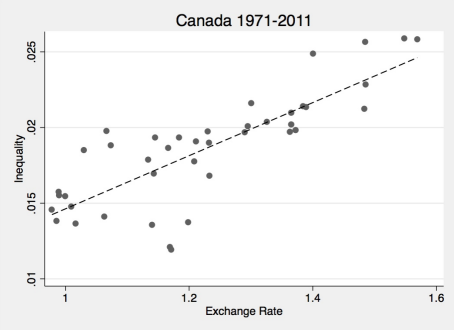


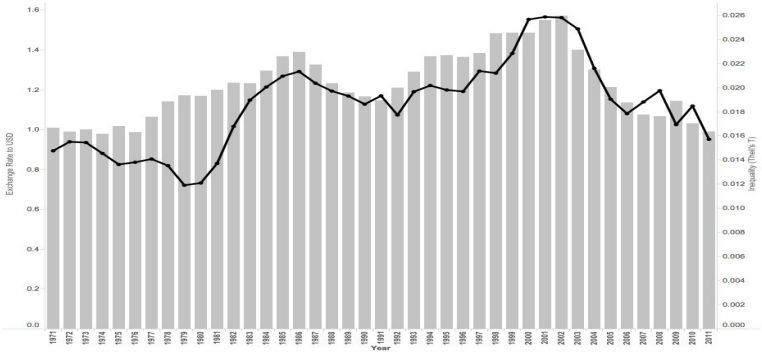




Canada

Canada can be considered a baseline model for the close relationship between movements in exchange rates and industrial pay inequality, due to five main characteristics of Canada's economy: (1) the Canadian dollar is considered a "pure" floating currency; (2) Canada has a "dual open economy": the export industries can be quite distinct from the non-export ones; (3) Canada's exports rely in large part on commodities (especially oil and timber) with prices set by international markets; (4) Canada has one big trading partner, the United States; 74% of its exports went to the US in 2013; and (5) Canadian financial markets are highly integrated with Wall Street. Thus, Canada is a case of free capital mobility and floating exchange rates in an integrated trade market where the main trading products are commodities whose prices are set at the international financial markets. In these conditions the correlation of inter-industrial pay inequality to the Canadian Dollar/USD exchange rate is very high.



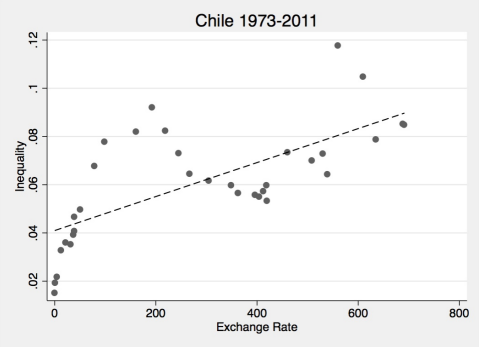


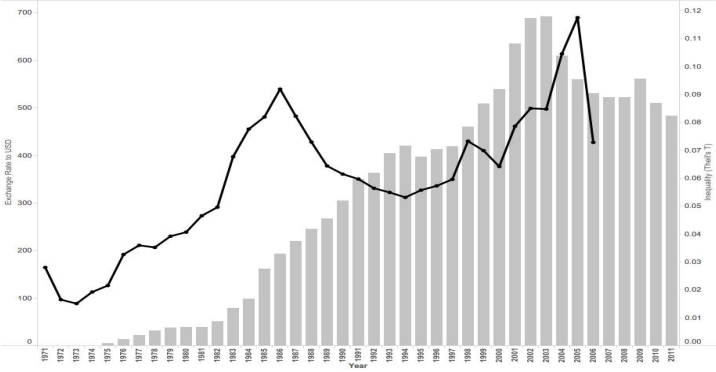
Chile and Mexico

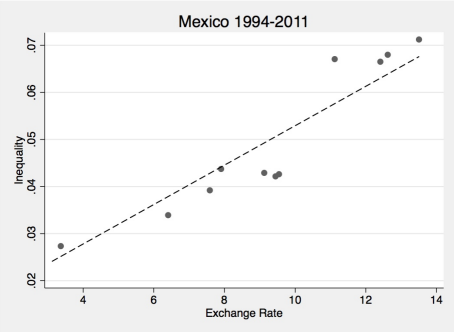
Latin American countries during the 1980s and 1990s switched from floating exchange rates to peg policies – in Argentina to a one-to-one convertibility scheme – or even to dollarization in the case of Ecuador. This fact makes our analysis more complex. However there are two open economies in the region with important levels of international trade and capital movement: Chile and Mexico.

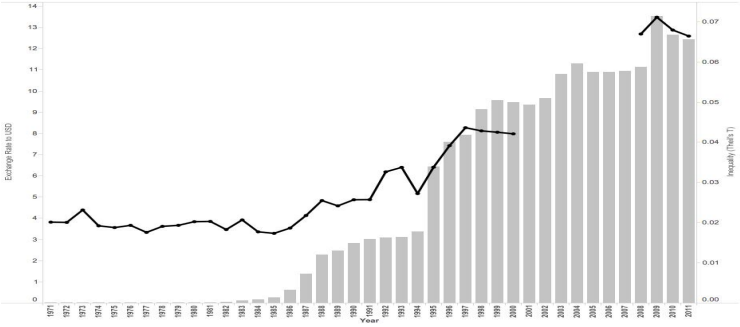
In Chile, the movement of inequality and exchange rates is consistent beginning in 1973, after the Pinochet coup d'état, except for the abrupt rise in inequality that followed the banking crisis in 1982, and which was partly reversed from 1985 to 1988. The government devalued to gain competitiveness until 2000, and in this period industrial pay inequality again followed the movement of the exchange rates.

Mexico had a pegged exchange rate with the USD up to 1994, when the Tequila Crisis hit and forced the country out of the peg. This is an example of how free capital movements and a highly integrated financial sector with a peg system can be very destabilizing. After the 1994 crisis, the Mexican peso devalued by 200% and it continues to depreciate today. Wage inequality across sectors in Mexican industries rose to its highest level in 2008, when the Mexican economy was hit by the U.S. financial crisis.









Croatia, Hungary, Poland, and Romania

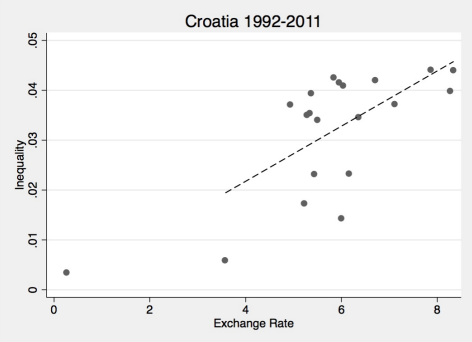
In each of the "transition economies" of Croatia, Hungary, Poland and Romania, we see a positive correlation of dollar exchange rates and inequality after the collapse of socialism and the liberalization of exchange rate policies in 1991.

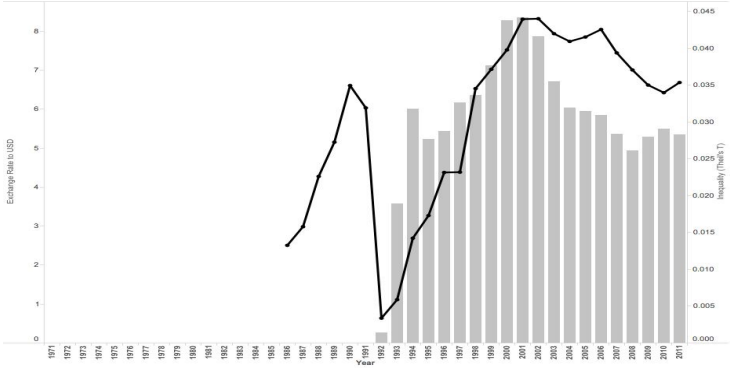
The Hungarian People's Republic was governed by a socialist regime from 1949 to 1989. Before the end of communism, Hungary had very low inter-industrial inequality and a stable exchange rate, made possible by strict controls. In 1990, Hungary staged its first democratic elections and transitioned toward a market economy, letting the forint float. Hungary joined the EU in 2004 and it is also expected to join the euro in the coming years. Within the period studied, there is a positive correlation between exchange rates and inequality.

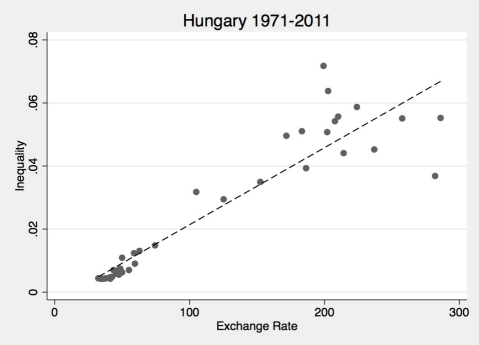
Croatia was part of the former Yugoslavia and fought a war for independence in 1991, gaining international recognition in 1992. Upon gaining independence, Croatia adopted a managed exchange rate, first having the Deutsche Mark as a reference and then the Euro. Despite having a managed floating exchange rate tied to a different currency, there is a positive correlation of the dollar exchange rate with industrial inequality. Croatia entered the European Union in 2013 and it is expected to join the Eurozone in the coming years.

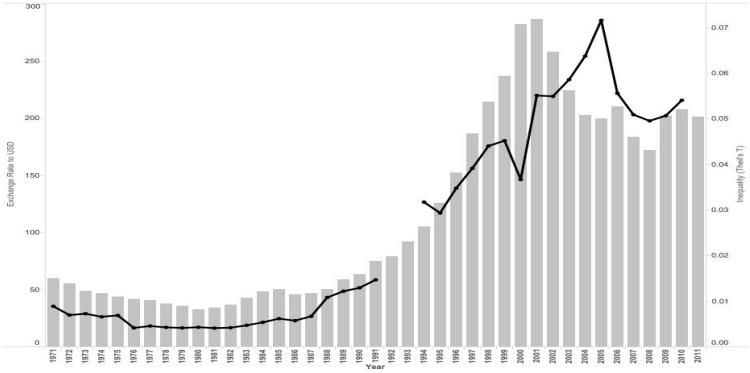
In 1989, Poland had its first parliamentary democratic election, and the new government undertook steps to transform the socialist-style planned economy into a market economy. Poland's floating exchange rate has been correlated with the level of industrial wage inequality ever since. Poland entered the EU in 2004 and it is expected to join the euro before 2020.

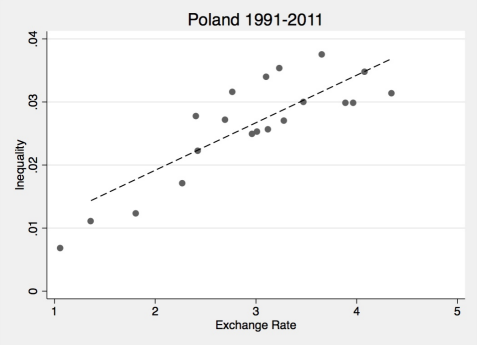
In Romania the communist regime ended in 1990. Since 1991, when the country adopted a flexible exchange rate system, there has been a positive correlation between exchange rates and industrial wage inequality. Romania joined the European Union in 2007 and it is also expected to join the Eurozone in the near future.

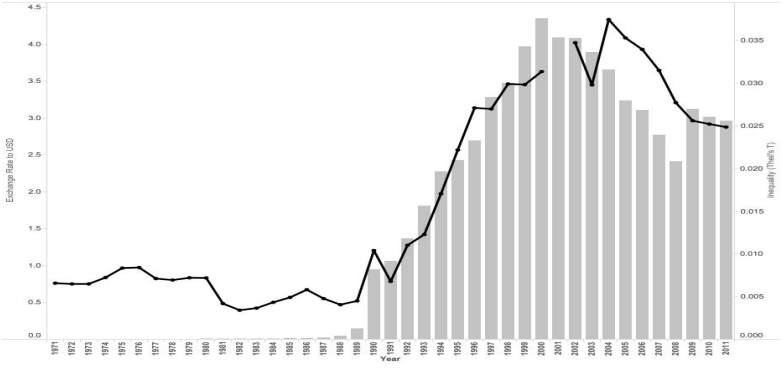


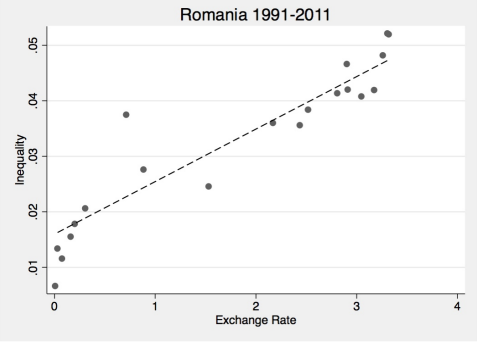


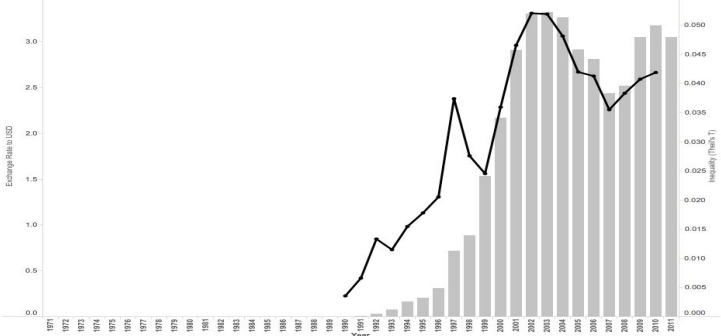






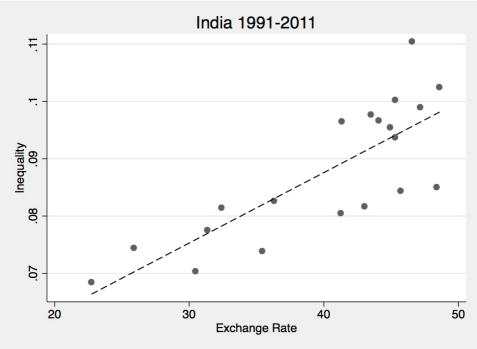


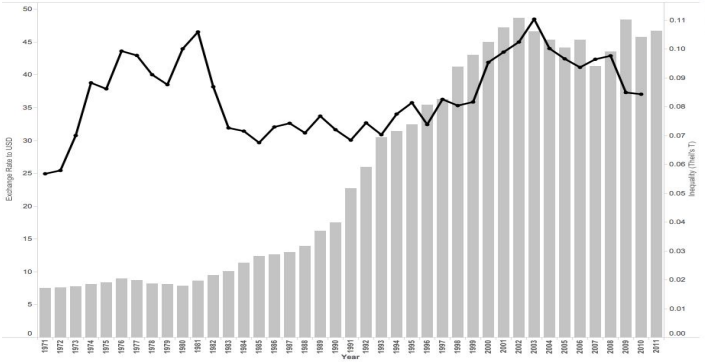




India

The Indian economy faced a deterioration of its external conditions and a crisis in 1991, which led the government to undertake a process of liberalization and adoption of strong economic reforms including the greater global integration of money, securities and foreign exchange markets. Following this development, industrial wage inequality has had a positive correlation with the exchange rate, which was not the case before.

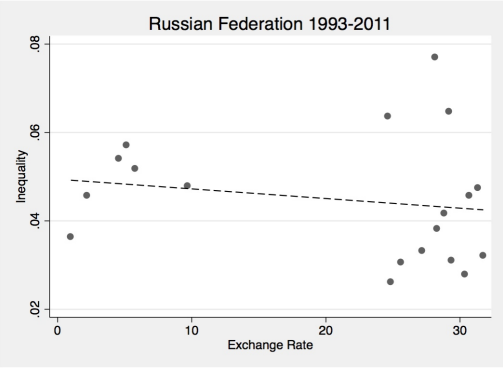


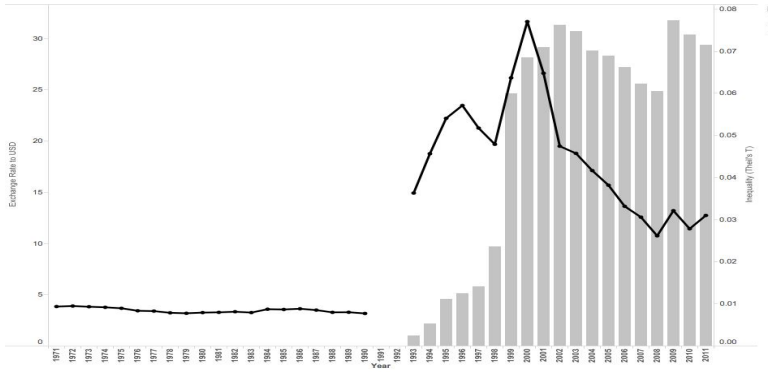


Russian Federation

In the 1990s, after the collapse of the Soviet Union, Russia liberalized its banking sector and introduced the convertibility of the Ruble. Russian external debt, in combination with fixed exchange rates and external restriction pressures, forced Russia into crisis and it defaulted on its debt in 1998.

The abrupt devaluation in Russia in 1998 corresponded to a sharp increase in industrial pay inequality, which however was largely reversed after 2002, when favorable conditions set in for export prices. For much of the 2000s, the exchange rate appreciated and inequality declined, although the correspondence is not close in statistical terms.



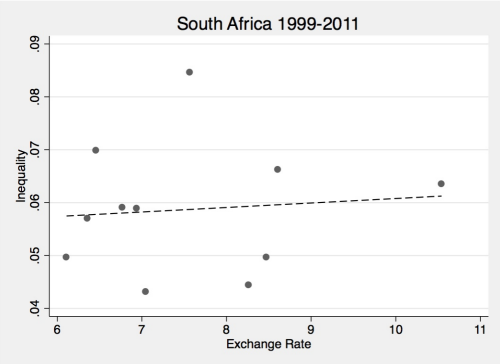


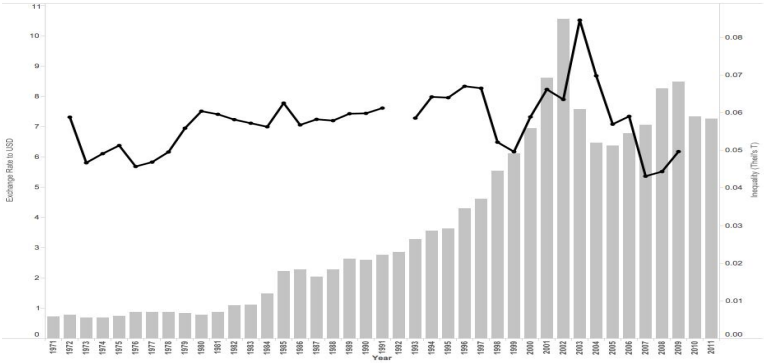
South Africa

South Africa formally ended the fixed peg back in the 1980s, but the international community imposed economic sanctions due to the apartheid regime, forcing the country to adopt trade restrictions. Following the first democratic elections in 1994, South Africa maintained its dual-

exchange rate system: one rate for financial transactions and another for transactions occurring in the real economy. This fact creates distortions for our analysis.

In 2000, South Africa opened its economy to foreign investment, relaxed restrictive labor laws, began privatization, and cut interest rates sharply from 1998 levels. As a result, we can see a positive correspondence between exchange rates and inequality beginning in 2000, sometimes with inequality movements lagging behind one or two years.



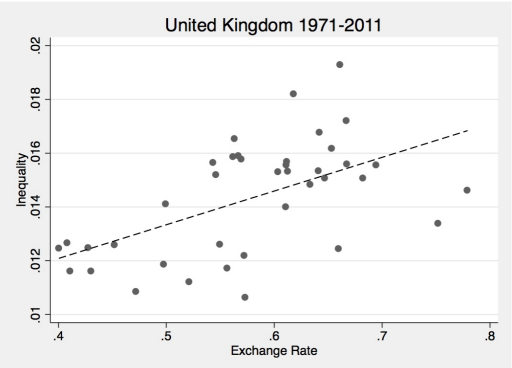


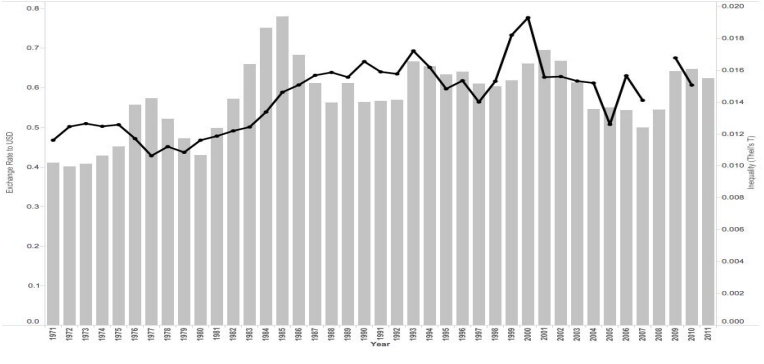
United Kingdom

In the United Kingdom, in 1979, Margaret Thatcher was elected Prime Minister and the country undertook a period of liberalization that included the adoption of floating exchange rates. As a consequence, after this period there is a clear correspondence between inequality and exchange rate movements.

Between 1990 and 1992, the U.K. entered the European Exchange Rate Mechanism, which aimed to create stability to increase trade among the members of the European Economic Community. However, two years later, financial speculators forced the country out of ERM. (Connolly, 1995)

Since this episode, the pound has had a floating exchange rate with the USD and the correlation between the exchange rate and inequality has been positive, although both variables are quite stable by international standards.





V. Estimating the exchange rates elasticity of inequality

In order to measure the sensitivity of industrial pay inequality to changes in the exchange rate, we propose a log-log model with country and year fixed effects as follows:

$$(1)\ \log Inequality_{it} = \beta_0 + \beta_1 \log ExchangeRate_{it} + \beta_2 \log ShareEmpl_{it} + \delta_i Country_i + \delta_t Year_t + \varepsilon_{it}$$

Where i are the countries and t are the years between 1970 and 2011 when those countries have had floating exchange rates. Thus, the data set is treated as unbalanced panel data. We separate two groups of countries: those in the text presented above and those in the appendix.

Inequality is measured by Theil statistics reported in the UTIP-UNIDO data set; *ExchangeRate* is the nominal exchange rate to USD reported by the IMF; and *ShareEmpl* is the share of industrial employment over the total population calculated using UNIDO's industrial employment and the World Bank's population measures. Model (2) controls for robust standard errors by clustering by country and model (3) excludes the variable *ShareEmpl*.

Table 2 shows nine variations of model (2). The base regression is a country fixed-effects-only regression of thirty-five countries, the twelve presented above and the twenty-three presented in the appendix. The other models are presented in groups of three, with regressions for just the twelve countries presented above, for just the twenty-three in the appendix, and for all thirty-five taken together. Robust standard errors are calculated using clustering by countries.

The results are broadly consistent across the models. In general, we see that a devaluation of 10% of the national currency implies between 2-3% increase in industrial pay inequality, with a preferred estimate, in our view, toward the high end of the range, since the time trend will capture common movements of exchange rates across countries, reducing a coefficient that in fact does capture the effect of the exchange rate. This simple formulation tends to capture about half of all variation in intersectoral industrial pay inequalities.

The coefficient on the variable Log*ExchangeRate* expresses the elasticity of industrial pay inequality measured across sectors to the variations in the exchange rate. The share of the population employed in the manufacturing sector is not statistically significant variable in any of the variations proposed, probably due to the fact that countries' fixed effects capture that information. Excluding the variable from the analysis (variations 5 and 9) maintains the significance and the level of exchange rates elasticity of inequality.

The causal chain in this instance can only run in one direction: from the exchange rate to the measures of inequality. There is no plausible reverse causation, under which a change in the measure of inequality would tend to affect the exchange rate. So we have here powerful evidence that exchange-rate variations, governed in large part by common movements of capital across the entire globe, have a strong effect on a major determinant of inequality within countries with open economies and floating exchange rates.

Table 2: summary coefficients from 9 variations of model (1)

	LogInequality	LogInequality	LogInequality	LogInequality	LogInequality	LogInequality	LogInequality	LogInequality	LogInequality
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
logExchangeRate		0.277	0.250	0.301	0.301	0.258	0.093	0.179	0.181
		(3.63)**	(2.57)*	(4.10)**	(4.05)**	(3.16)**	(1.19)	(2.82)**	(2.98)**
logShareEmpl		-0.813	0.356	-0.022		-0.762	0.299	0.110	
		(1.91)	(1.19)	(0.08)		(1.63)	(1.04)	(0.43)	
_cons	-3.053	-6.455	-2.765	-4.224	-4.149	-6.101	-2.912	-3.736	-4.114
	(-19.53)**	(5.07)**	(2.42)*	(4.32)**	(28.09)**	(4.56)**	(2.65)*	(4.30)**	(21.99)**
Country FE	X	X	X	X	X	X	X	X	X
Year FE						X	X	X	X
Robust Std.Erros		X	X	X	X	X	X	X	X
Countries	Both	Text	Appendix	Both	Both	Text	Appendix	Both	Both
R^2	0.68	0.51	0.26	0.29	0.28	0.56	0.53	0.47	0.47
N	847	335	493	828	840	335	493	828	840

* p<0.05; ** p<0.01

How important then is the effect of exchange rate movements on gross household inequality as measured by the Gini coefficient? According to the work of Galbraith et al. (2014), the elasticity of a set of measured income inequality Gini coefficients to the UTIP-UNIDO Theil statistical is on the order of 0.10; thus a ten percentage point movement in the Theil for inter-sectoral industrial pay produces a one percentage point movement in the Gini for household income inequality. Given the coefficient estimate of 0.3 for the elasticity of the Theil with respect to the exchange rate, we have a combined elasticity of 0.03 of the Gini coefficient with respect to the exchange rate. Thus, a 50 percent increase (depreciation) of the exchange can be expected to yield, on average, a 15 percent increase in the Theil for industrial pay between sectors and a 1.5 percent move in the Gini coefficient for incomes. For a Gini coefficient initially in the range of 45, this works out to an increase of roughly 0.67 or two-thirds of a Gini point. Considering that this is a short run effect, that movements of the Gini coefficient are damped, and that many depreciations (that is, increases in the local currency exchange rate measured against the dollar) are considerably greater than 50 percent, this is a substantial effect.

Exchange rates between 2011 and 2016

The figures below show the evolution of exchange rates in selected OECD countries and in Brazil, Russia, India, China and South Africa from 2011 to 2016. We include them to show the dramatic recent developments. With the exceptions of China and United Kingdom, we can observe a high degree of recent devaluation, including an almost 25% devaluation of the euro against the USD. Recent developments also include a 154% devaluation of the Argentine Peso and a 38% devaluation of the Mexican Peso. Among the BRICS the devaluation has been exceptionally strong; Brazil devalued 130%, Russia 125%, India 45%, and South Africa 102%. Again the sole exception so far is China, which revalued the RMB by 2% in this period. However the more recent devaluation of the RMB may soon reverse that trend.

The evidence of this paper suggests that devaluations will transfer directly to the structure of industrial pay and therefore to the income distribution of the affected countries. This means that in the coming years – indeed beginning now – pay and income inequality will rise in

Eastern Europe, Latin America, Asia and Africa, and the gains against inequality evident in many of these regions since 2000 may soon be reversed.

Figure 1: Evolution of foreign exchange rates to the USD for selected OECD Countries

From 1st quarter 2011 to 4th quarter 2015. Exchange rates in percentage change with base year 2011 set to 100. Source: IMF

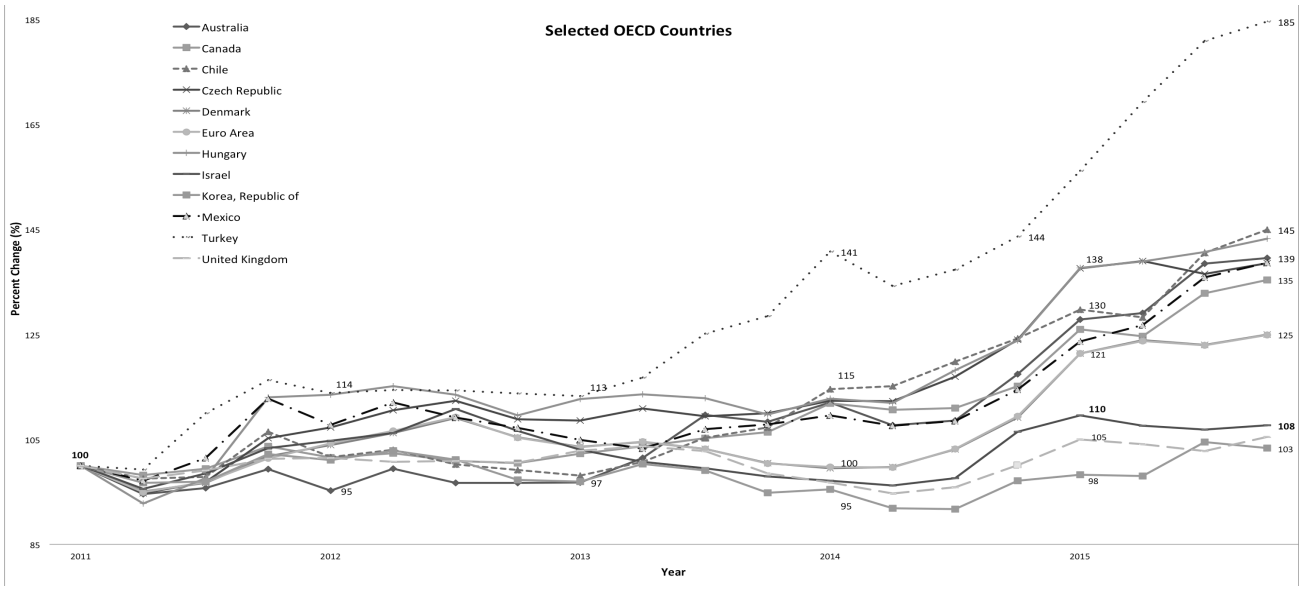
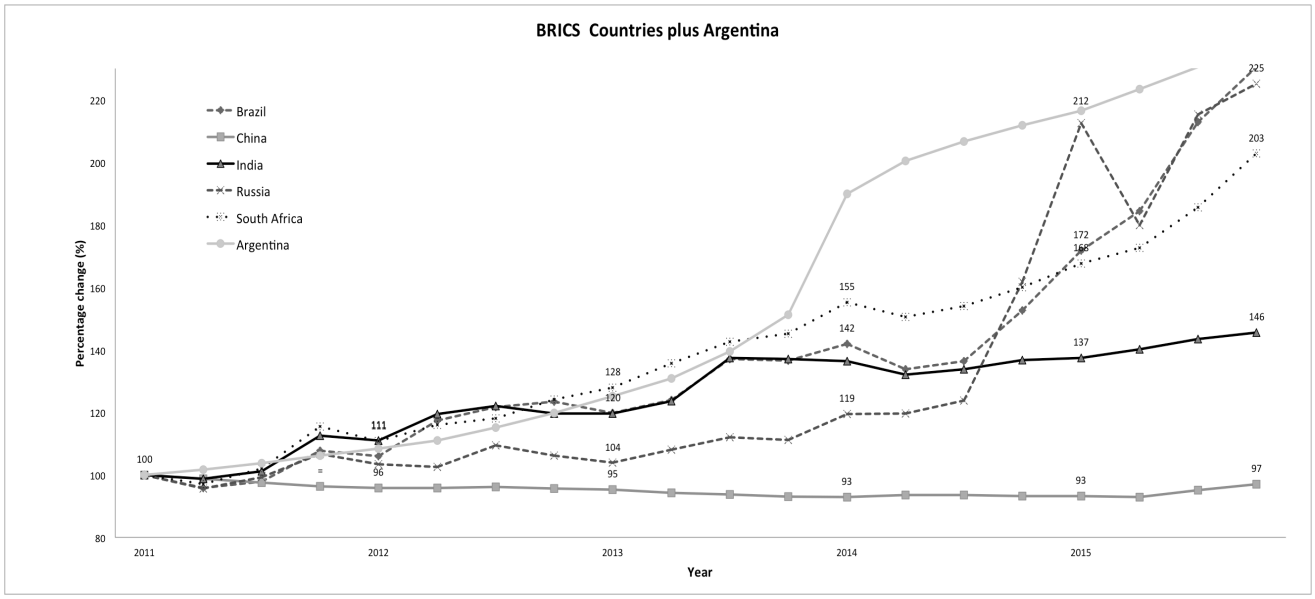


Figure 2: Evolution of foreign exchange rates to the USD for BRIC Countries plus Argentina

From 1st quarter 2011 to 4th quarter 2015. Exchange rates in percentage change with base year 2011 set to 100. Source: IMF



VI. Conclusion

This paper has explored the relationship between exchange rates and industrial pay inequality in thirteen different countries, each of which either has experienced floating exchange rates throughout the period or adopted such a policy at a definite moment during the period under examination. We find that the local currency exchange rate against the dollar is a dominant determinant of the movement of inter-industrial pay inequality once exchange rates are permitted to float.

The underlying logic is straightforward: export-oriented sectors are relatively well-paid, and their earnings in local currency rise automatically when the national currency devalues, hence inflating the pay gap between export- and non-export sectors. Since we already know that inter-industrial pay inequality is a strong determinant of household income inequality, it follows that the exchange-rate is a uniquely powerful determinant of income inequality as well, in many developed and developing countries.

This finding leads toward a number of general conclusions about the nature of economic inequalities in a globalized world. The most important of these is to underscore that in most countries economic inequality is not under the control of local policy, and does not depend on technology or education in the short run. It is rather driven by international financial and global macroeconomic forces; and it can be held at bay only by either walling oneself off from those forces, through capital controls, or by bringing the volatility and the asymmetrical bias toward devaluation in developing countries under some new form of international control.

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Appendix I: Further evidence from other countries

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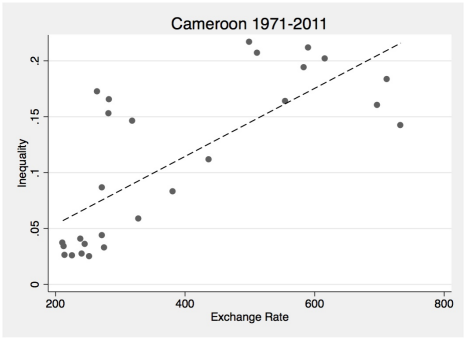

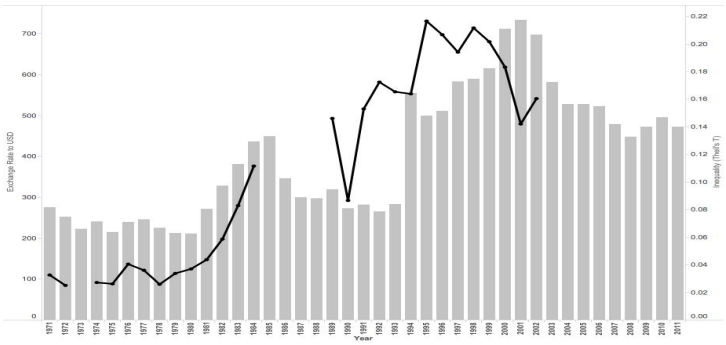

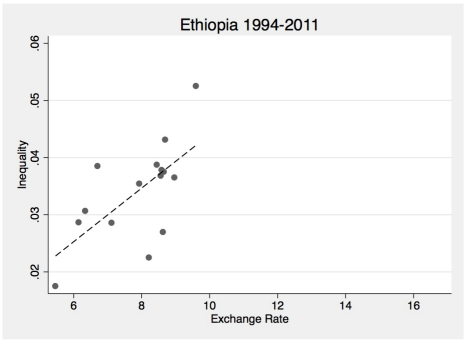

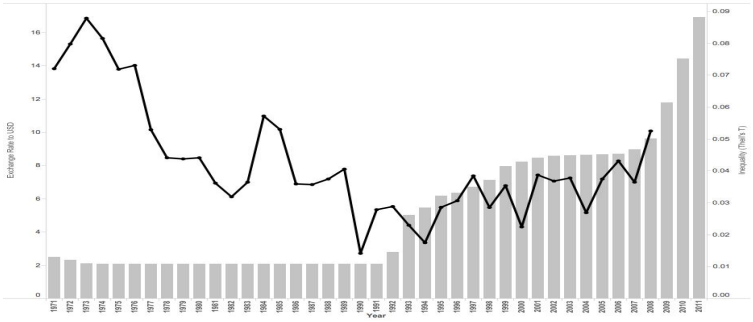

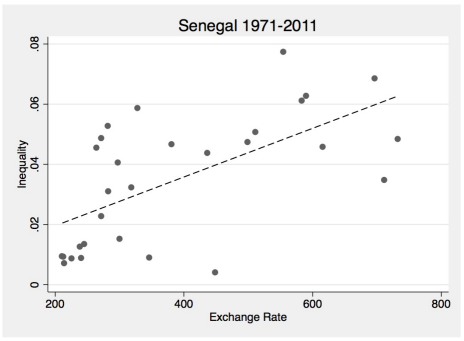

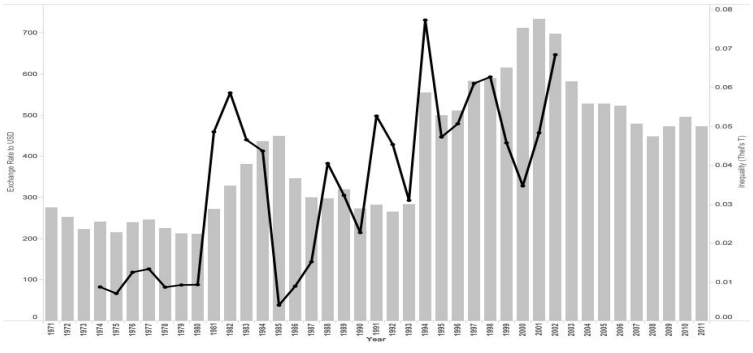

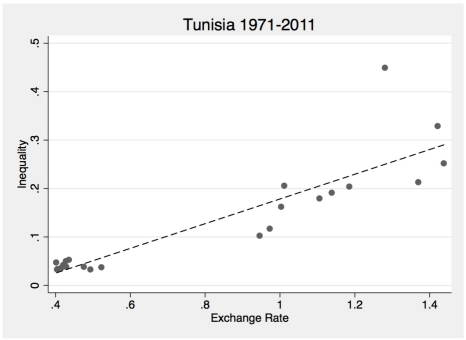

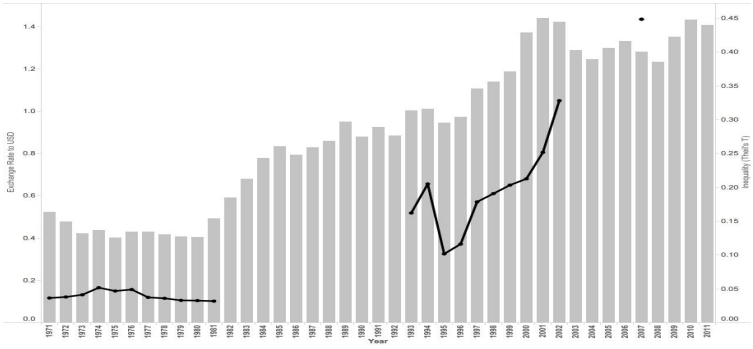

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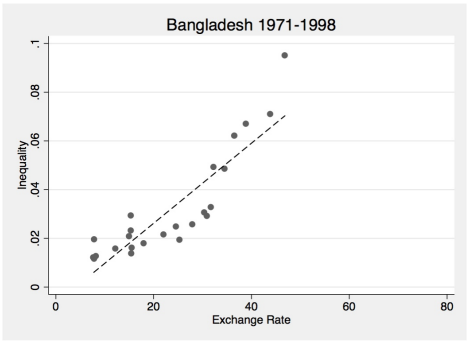
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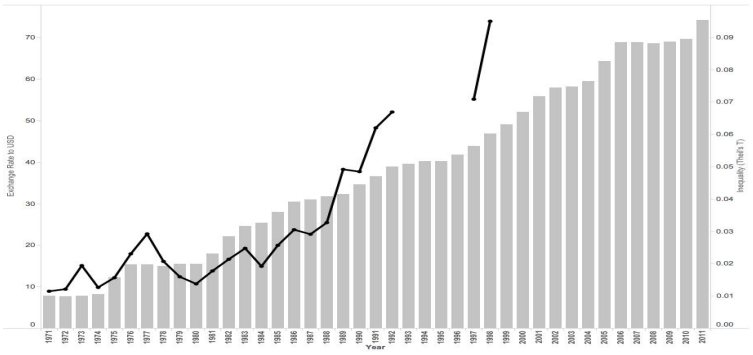
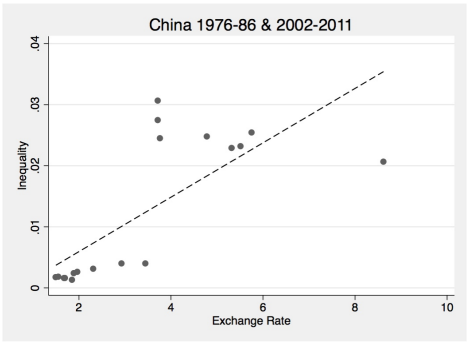
Inequality
Exchange Rate


Exchange Rate to USD
Inequality (Theil's T)
Year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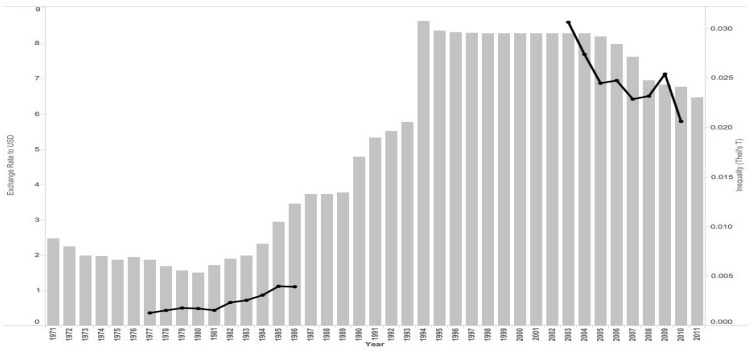
Inequality
Exchange Rate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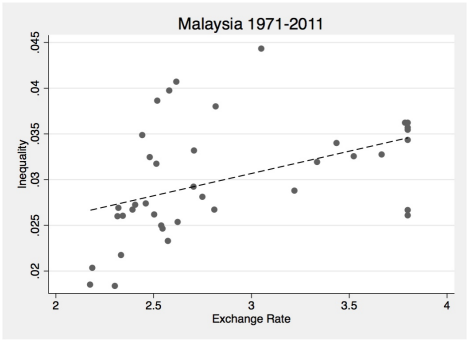
Inequality (Theil's T)
Year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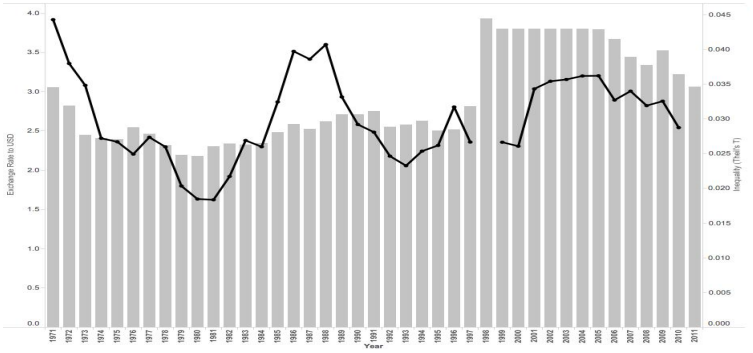
Exchange Rate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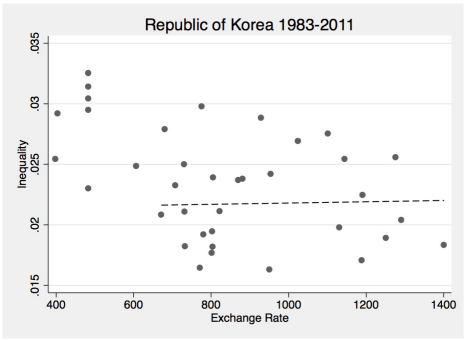
Inequality (Theil's T)
Year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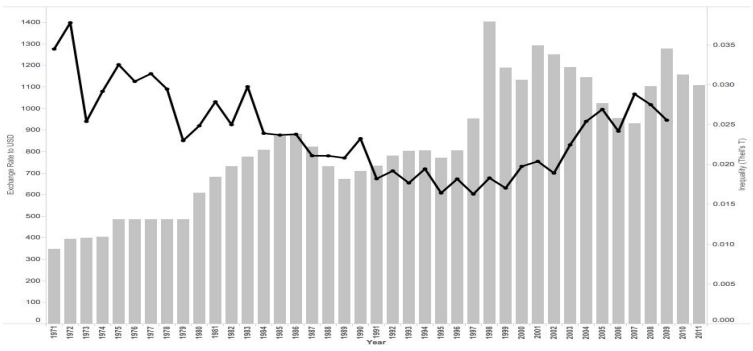
Inequality
Exchange Rate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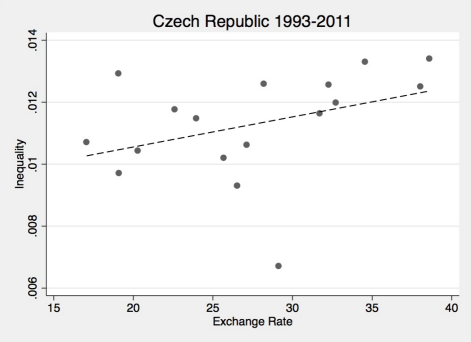
Europe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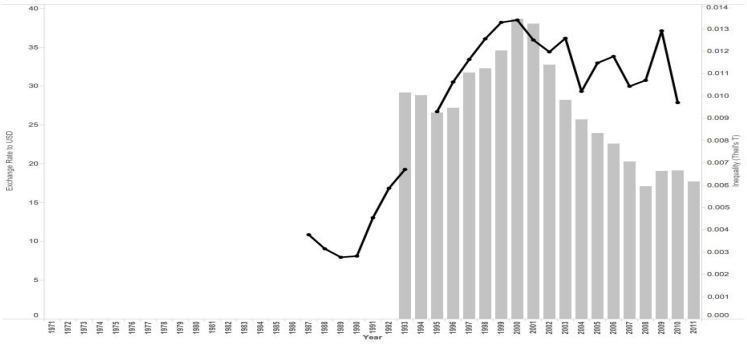
Exchange Rate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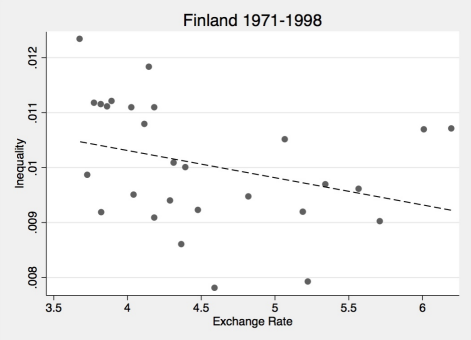
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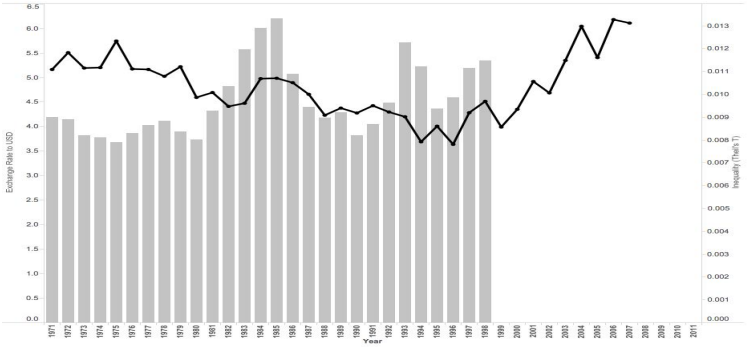
Exchange Rate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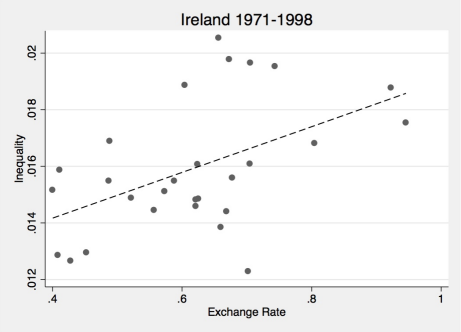
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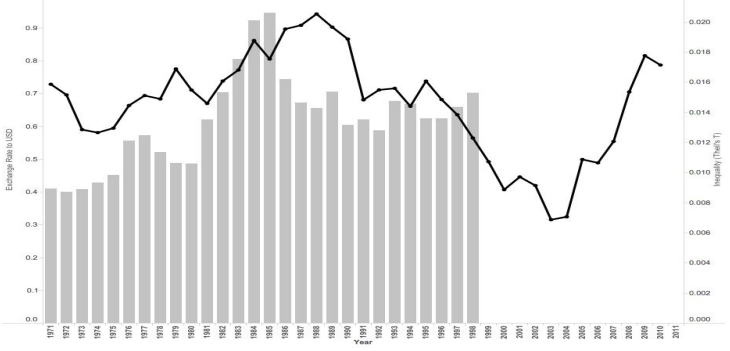
Exchange Rate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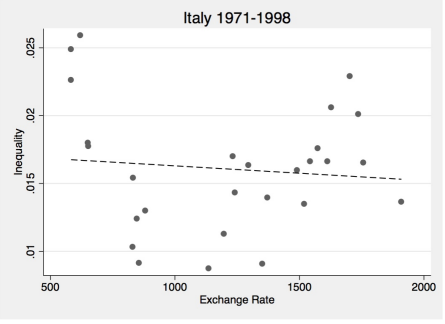
Year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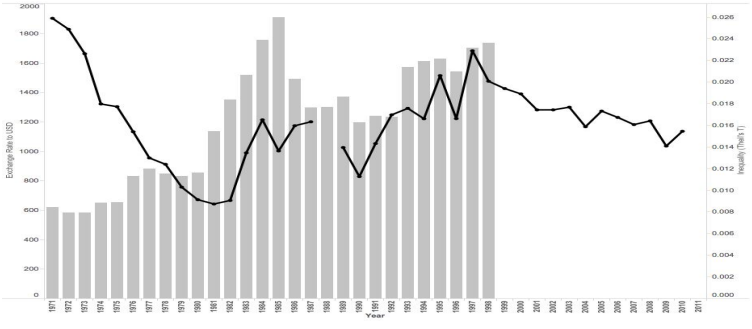
Exchange Rate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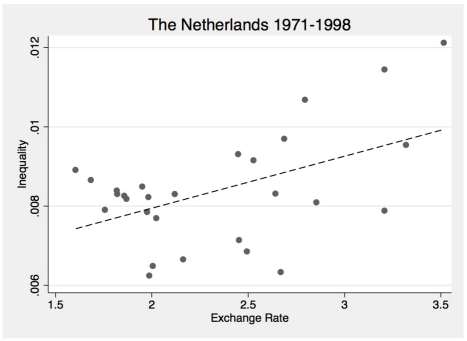
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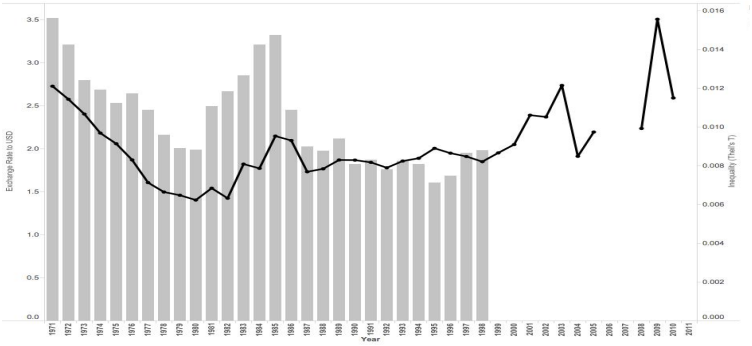
3
3.5
Exchange Rate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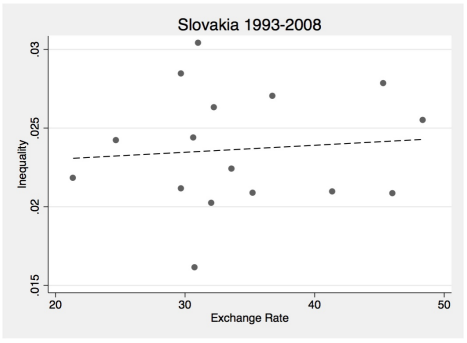
Year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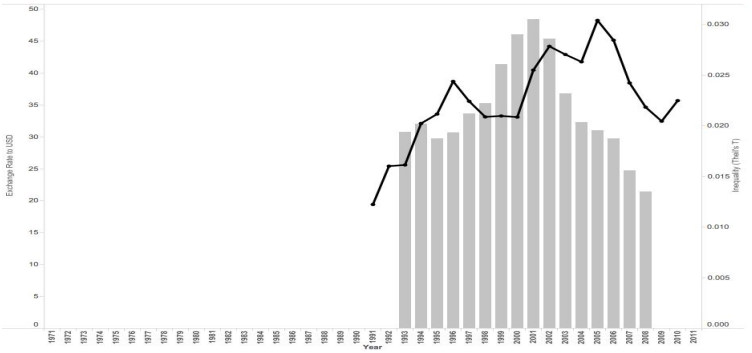
.025
.03
20
30
40
50
Exchange Rate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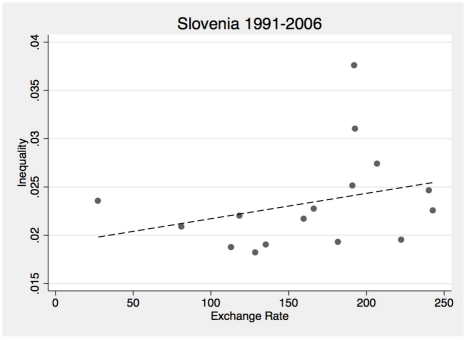
Inequality (Theil's T)
Year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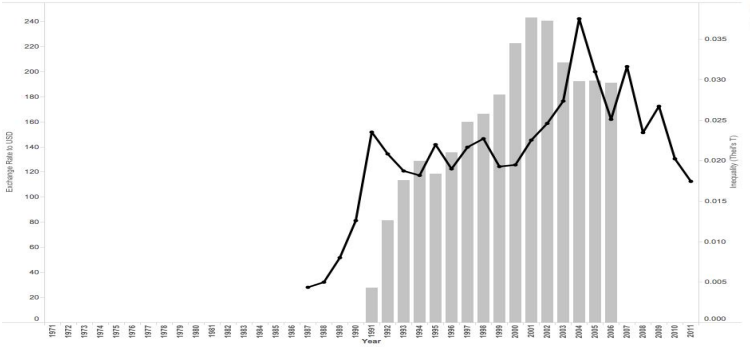
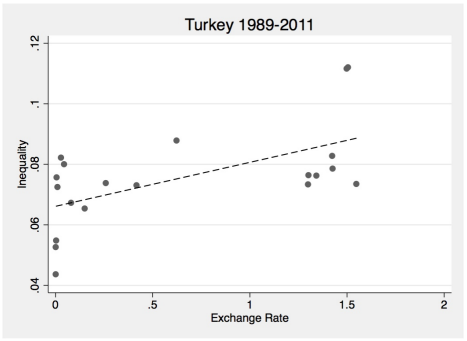
Exchange Rate


Exchange Rate to USD
Inequality (Theil's T)
Year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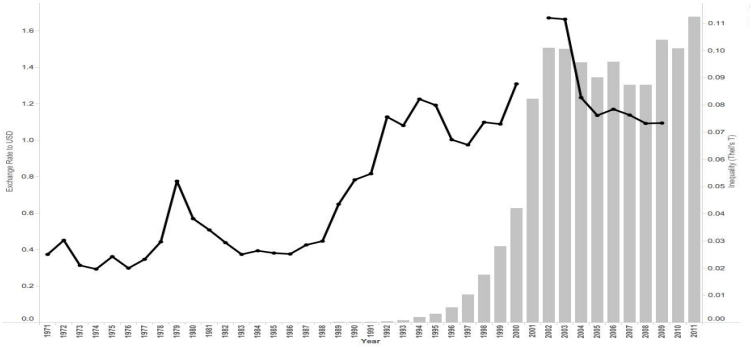
2
Exchange Rate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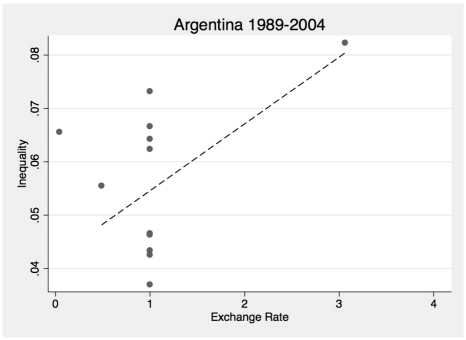
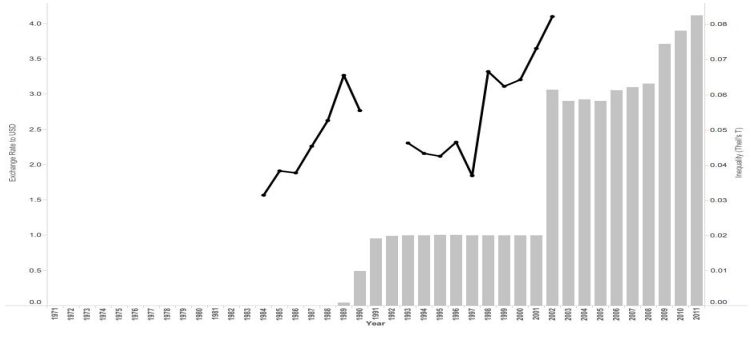
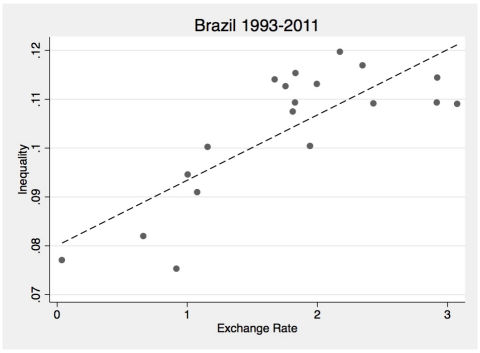
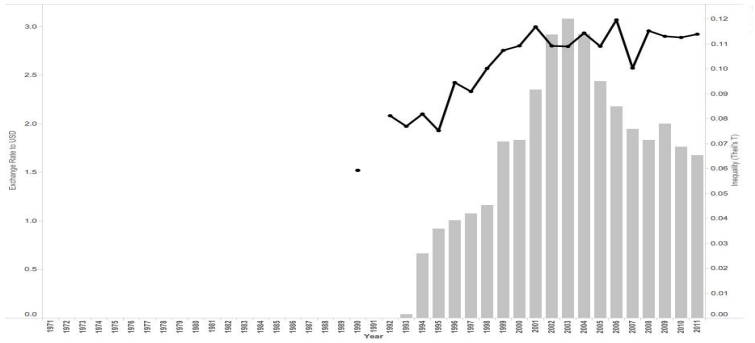
Inequality (Theil's T)
Year

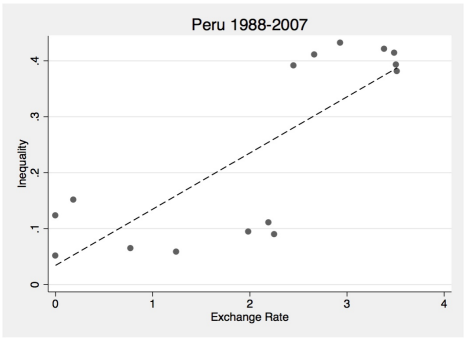
Latin America

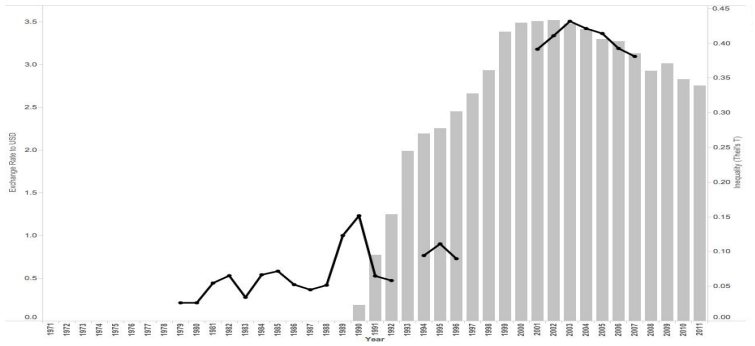


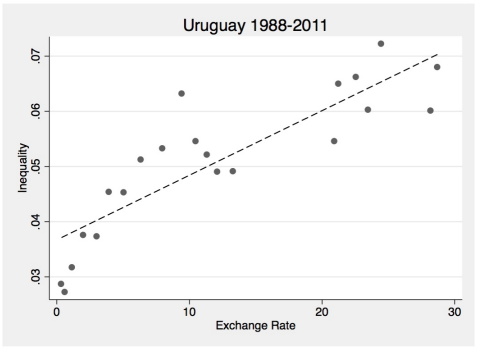


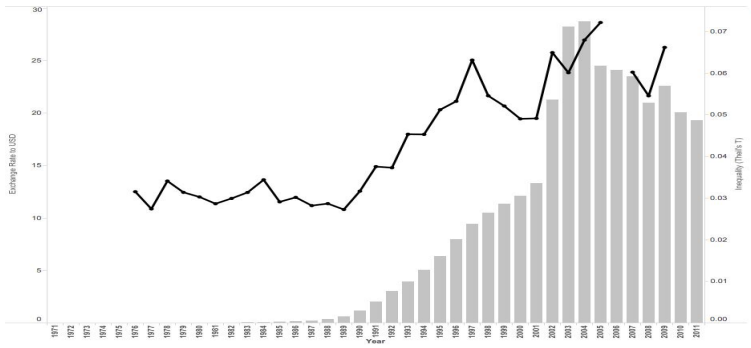




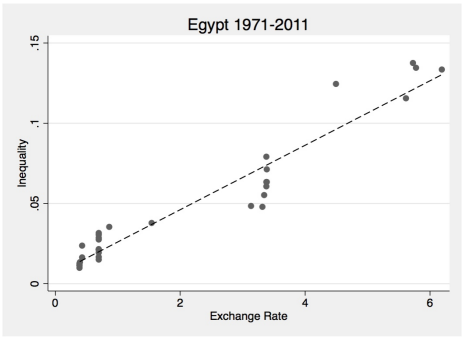


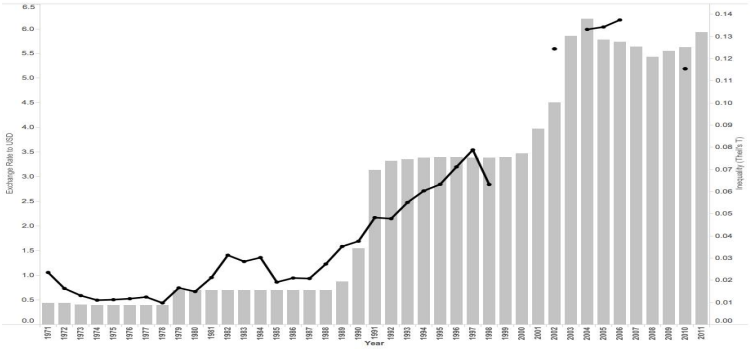


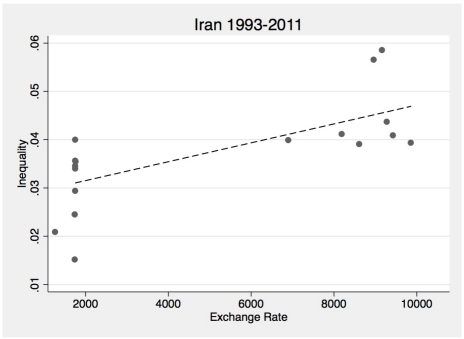


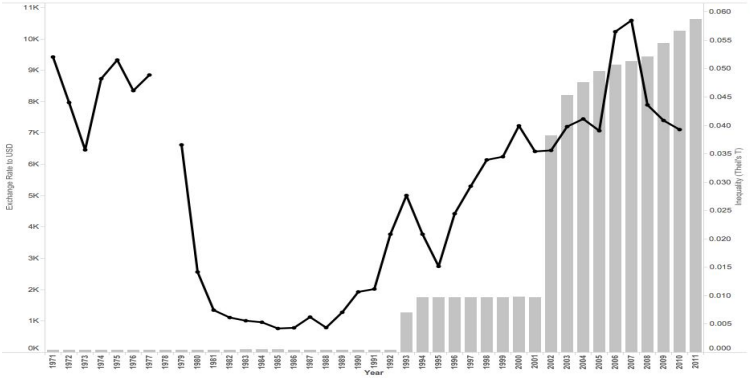


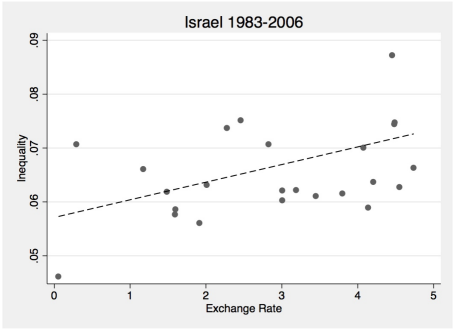
Middle East

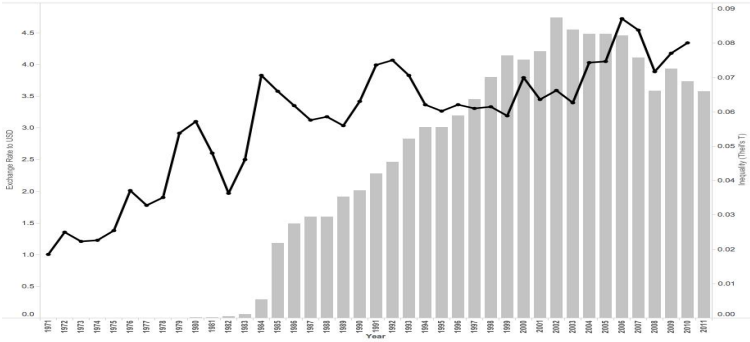

Egypt 1971-2011
Inequality
Exchange Rate


Exchange Rate to USD
Inequality (Theil-L T)
Year


Iran 1993-2011
Inequality
Exchange Rate


Exchange Rate to USD
Inequality (Theil-L T)
Year


Israel 1983-2006
Inequality
Exchange Rate


Exchange Rate to USD
Inequality (Theil-L T)
Year