

Personal income taxation and income inequality in Asia-Pacific: a cross-country analysis

Sergey A. Belozyorov

Saint-Petersburg State University, Saint-Petersburg, Russian Federation

ORCID: [0000-0001-8711-2192](https://orcid.org/0000-0001-8711-2192)

Olena V. Sokolovska

Saint-Petersburg State University, Saint-Petersburg, Russian Federation

ORCID: [0000-0002-4259-3786](https://orcid.org/0000-0002-4259-3786)

ABSTRACT

The article examines analyze current features of personal income taxation, and also the relationship between income inequality, individual income taxes and several labor market indicators in Asia-Pacific countries. The income inequality issue affects basic social and economic terms as equity and equality. The increase in income inequality in countries worldwide led to vigorous debate about efficiency of progressive individual income taxation as a tool for achieving optimal level of social equity. The purpose of the study is to examine the features of progressive individual income taxation and its influence of reduction of income inequality in Asia-Pacific countries. The article analyzes current systems of personal income taxation in countries of this region and their relationship with key macroeconomic indicators. The methodology includes cross-country comparisons, principal component analysis, regression analysis. The main theoretical results include identification of causes of inefficiency of progressive individual income taxation in analyzed countries. The empirical results are related to the estimation of influence of macroeconomic factors, including labor market indicators, on individual income tax revenue. The applied methods, notably principal component analysis combined with regression analysis, can be used for estimation of influence of both quantitative and qualitative factors on tax revenue.

KEYWORDS

personal income tax, income inequality, progressivity, Asia-Pacific, Gini coefficient, cross-country comparisons, principal component analysis, regression analysis

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HIGHLIGHTS

1. The tax theory suggests that the progressive individual income tax system can be an effective tool for reduction of income inequality
2. For developing Asia-Pacific countries, the progressive personal income tax systems cannot contribute to the reduction of inequality since the tax base is narrow because of high free-tax thresholds and large informal sector of the economy
3. The developed Asia-Pacific countries have relatively high personal income tax revenues and low Gini coefficients, except Singapore with high income inequality level and GDP per capita similar to developed countries. One of the main reasons of high inequality in this country are the features of government tax policy
4. In developing Asia-Pacific countries only statutory nominal gross monthly minimum wage has significant impact on individual income tax revenue, and this impact depends crucially on the GDP per capita; the main reason are high tax-free personal income thresholds in these countries

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Индивидуальное подоходное налогообложение и неравенство доходов в странах Азиатско-Тихоокеанского региона: сравнительный анализ

С. А. Белозёров*Санкт-Петербургский государственный университет, Санкт-Петербург, Россия*ORCID: [0000-0001-8711-2192](https://orcid.org/0000-0001-8711-2192)**Е. В. Соколовская***Санкт-Петербургский государственный университет, Санкт-Петербург, Россия*ORCID: [0000-0002-4259-3786](https://orcid.org/0000-0002-4259-3786)

АННОТАЦИЯ

В статье рассматриваются особенности индивидуального подоходного налогообложения, а также взаимосвязь неравенства доходов, индивидуальных подоходных налогов и ряда индикаторов рынка труда в странах Азиатско-Тихоокеанского региона. Проблема неравенства доходов затрагивает базовые социально-экономические понятия как справедливость и равенство. Рост неравенства доходов в странах мира привел к активному обсуждению эффективности прогрессивной системы индивидуального подоходного налогообложения как инструмента достижения социальной справедливости. Цель данного исследования заключается в исследовании особенностей применения прогрессивной системы индивидуального подоходного налогообложения и ее влияния на сокращение неравенства в странах Азиатско-Тихоокеанского региона. В статье проанализированы существующие системы налогообложения индивидуального дохода стран региона и их взаимосвязь с ключевыми макроэкономическими показателями. Методология исследования включает межстрановой анализ, метод главных компонент, регрессионный анализ. Основные результаты теоретического исследования заключаются в выявлении причин неэффективности системы прогрессивного индивидуального подоходного налога как инструмента сокращения неравенства доходов в анализируемых странах. Результаты эмпирического исследования связаны с оценкой влияния макроэкономических факторов, в том числе показателей функционирования рынка труда, на уровень поступлений от индивидуального подоходного налога. Методика исследования, в частности, применение метода главных компонент в сочетании с регрессионным анализом, может в дальнейшем быть использована для оценки влияния количественных и качественных факторов на уровень налоговых поступлений.

КЛЮЧЕВЫЕ СЛОВА

индивидуальный подоходный налог, неравенство доходов, прогрессивность, Азиатско-Тихоокеанский регион, коэффициент Джини, межстрановой анализ, метод главных компонент, регрессионный анализ

ОСНОВНЫЕ ПОЛОЖЕНИЯ

1. Одно из предположений теории индивидуального подоходного налогообложения заключается в том, что прогрессивность этого налога может быть эффективным инструментом сокращения неравенства доходов
2. Для развивающихся экономик Азиатско-Тихоокеанского региона прогрессивная система индивидуального подоходного налогообложения не способствует сокращению неравенства, возникающей вследствие установления высоких пороговых значений дохода, освобожденного от налогообложения, и значительного неформального сектора экономики
3. Развитые страны Азиатско-Тихоокеанского региона характеризуются относительно высокими доходами от индивидуального подоходного налога, при одновременно низком индексе Джини, за исключением Сингапура, который

характеризуется высоким показателем неравенства доходов при ВВП на душу населения, сравнимом с развитыми странами. Такая ситуация сложилась, в том числе и под влиянием налоговой политики правительства

4. В развивающихся странах Азиатско-Тихоокеанского региона значимое влияние на уровень поступлений от индивидуального подоходного налога имеет только номинальная валовая минимальная ежемесячная заработная плата и это влияние критически зависит от уровня ВВП на душу населения, что обусловлено высокими пороговыми значениями дохода, освобожденного от налогообложения, в этих экономиках

Introduction

The problem of income (economic) inequality affects all sections of society, since changes in inequality levels have explicit consequences for standards of living of households. Also they affect such basic social and economic terms as equity and equality.

The increase in income inequality in countries worldwide led to vigorous debate about this problem in its various aspects.

According to the World Inequality Report 2018, in recent decades, income inequality has increased in nearly all countries worldwide, but at widely different rate. In 2016 the share of total national income accounted for by just that nation's top 10% earners was 37% in Europe, 41% in China, 46% in Russia, 47% in US-Canada, and around 55% in sub-Saharan Africa, Brazil, and India, and 61% – in the Middle East [1, p. 9].

The tax policy can be considered as one of the main tools to reduce inequality by redistributing the tax revenue. Taxes are the source of revenue, aimed to finance public spending on education and health care, and also social benefits through transfer programmes. The government spending increases the wealth of low-income households, and also contributes to the development of infrastructure, ensuring the economic growth. The mentioned factors are suggested to be crucial, while achieving the optimal level of social equity.

Progressive tax rates are able to reduce not only after-tax income inequality, but also before-tax income inequality by reducing motivation of high-salaried individuals to increase their income using, particularly, an aggressive bargaining.

The paper is structured as follows. Section 1 provides literature review of theoretical and empirical studies related to the income inequality and progressive personal income taxation. Section 2 briefly describes theoretical background and main causes of failure of progressive personal income tax to address inequality in Asian countries. Section 3 provides results of empirical analysis of relationship between income inequality, individual income taxes and several labor market indicators in Asian countries.

1. Literature review

The reduction of income inequality, e.g. through fiscal policy measures, is an important direction of macroeconomic research. The increasing income gap between rich and poor determined the study of causes of relative inequality, and also the development of sustainable and effective policy aimed to reduce income inequality and poverty.

The inequality of income in countries worldwide, its causes, consequences, and approaches to adjust, are subjects of research of both economic theorists and experts of international economic financial organizations.

A. Deaton, the 2015 Nobel Prize in Economics winner, in his work *The Great Escape: Health, Wealth, and the Origins of Inequality* analyzed historical and ongoing patterns of inequality in countries in the world. Notably, he examined the United States, China and India. For the last two countries he argued that international aid has been ineffective and even harmful, leading to the growth of income inequality, while lifting trade restrictions would be better tool for achieving optimal level of social equity [2].

Another Nobel Prize in Economics winner J. Stiglitz analyzed the influence of inequality on economic growth. He concluded that the income inequality is a key factor deepening the economic problems of rich countries. According to J. Stiglitz, in order to reduce such inequality countries should focus on the wide range of policies, notably investment in public goods, better corporate governance, anti-trust and anti-discrimination laws, and more progressive tax policy [3].

A series of works of T. Piketty, one of the most likely Nobel Prize in Economics winners in 2015, are also devoted to the analysis of theories of persistent inequality and wealth across generations [4].

The theories of genesis of economic inequality, its causes and effects, became the subject of study of G. Garvy [5], S. Durlauf [6], K.-K. Lee [7], D. Krueger & F. Perri [8].

A significant number of research studies, provided by experts of leading international financial and economic organizations (UN, IMF, the World Bank), analyze income inequality in developing countries. They showed that policies that focus on the poor and the middle class, including reforms to increase human capital and skills, coupled with making tax systems more progressive, can mitigate inequality [9–11].

The methodology of estimation of income inequality as a whole was investigated empirically in A. Heshmati [12], N. C. Kakwani [13], J. L. Gastwirth [14], R. I. Lerman & S. Yitzhaki [15].

The level of income inequality in countries worldwide was estimated in E. Helpman et al. [16], S. Anand & P. Segal [17], U. Panizza [18], and also by OECD experts [19–20].

A significant series of works consider the influence of taxation on the level of income inequality in countries. The impact of personal income tax on both the distribution of income and the inequality level in USA was investigated in B. Okner [21], G. Auten & D. Splinter [22], D. Puy et al. [23]. Their results showed the ambiguous and often oppositely directed effects of fiscal policy on

inequality level for U.S. households with different income levels.

A. Paulus & A. Peichl investigated the consequences of the introduction of a flat tax as a tool to reduce income inequalities in Western Europe countries. Using simulation models, authors concluded that revenue and inequality neutral flat tax rates tend to be higher in Continental European countries (Austria, Germany, Luxemburg, Netherlands) than in Southern European countries (Greece, Portugal, Spain), while being little affected by different measures of income inequality [24].

The investigation of effects of progressive personal income taxation on inequality has a fundamental importance for Asian countries because of significant dispersion of values of indicators of economic inequality in region.

T. Tachibanaki discussed history and the causes of Japan's increasing income inequality in 1990–2000s, considering among other things the influence of government tax policy on households' income distribution [25].

H. Ohta provided an analysis based on simulation of changes in expenditures of Japanese households with different income levels. He concluded that the introduction of more progressive tax system should have positive effects on total consumption, thereby raising growth rate in country and improving the fiscal balance [26]. M. J. Sung examined the redistributive effects of Korea's government fiscal policies in mid-2000s. He find that taxes and transfers reduce income inequality in Korea by 13.8%. Contrary to the popular belief that direct taxes are the key tool for redistribution, in-kind benefits, direct taxes, and social security contributions all decrease the inequality (expressed by Gini coefficient) by 6.7%, 4.7%, and 2.9%, respectively [27].

While an opposite results were obtained by Y. Chang et al., who concluded that a more progressive income tax schedule along with a higher capital tax rate can increase average welfare by as much as 0.86% of permanent consumption. But the limitations of their quantitative heterogeneous agent general

equilibrium model do not take into account possible capital outflows and the increased administrative costs caused by higher taxes [28].

With this background, the purpose of the paper is to analyze current features of personal income taxation, and also the relationship between income inequality, individual income taxes and several labor market indicators in in Asia-Pacific countries.

2. Theoretical background

The policy related to the reduction of inequality and poverty, is often motivated by government's aspiration to achieve horizontal and vertical equity. With regard to fiscal policy, the horizontal equity means that all individuals in equal financial conditions have equal opportunities to pay taxes, and, therefore, should be taxed by equal rate.

The vertical equity suggests that wealthy individuals should be taxed by higher tax rates than poorer ones.

The degree of tax progressivity influences on level of income inequality. Moreover, the adjustment in the degree of inequality resulting from change in tax policy, due to economic agents' asymmetric responses to policy changes, may be postponed before becoming effective [29].

The results of current research related to the consequences of fiscal policy measures aimed to reduce inequality, can be summarized as follows.

1. Both taxes and transfers reduce income inequality in countries worldwide. Furthermore, in OECD countries the transfers suppose to reduce $\frac{3}{4}$ of inequality, while direct taxation of household income doesn't play an important role in this process.

2. The systems of personal income taxation traditionally are progressive, while consumption taxes and property taxes often absorb the large part of income of disadvantaged population.

3. Some tax and transfer reforms yield double dividend in terms of reducing inequality and increasing GDP per capita. In particular, the reduction of tax incentives,

used generally by low-income households, contributes to equity objectives, allowing simultaneously the reduction in tax rates.

4. Other reforms, on the contrary, may entail trade-offs between reduction of inequality and economic growth. Shifting the tax mix to less-distorting taxes, notably, away from labor towards consumption taxes, would improve incentives to work and savings, but simultaneously would raise inequality [30].

The personal income tax (PIT) is widely considered as the main component of progressive tax system. In developed countries such a tax is supposed to be not only a major government revenue source, but also influences significantly to income redistribution as a tool to achieve equity and equality objectives.

But in many Asian countries the situation differs from above. The PIT revenue is largely stagnant and low, compared to that of industrialized economies. Such low PIT income restricts opportunities for redistribution, contributing thereby to increase of inequality. In addition, the greatest share of personal income, subject to tax, came from labor income, while individual income from capital and other economic activity, including self-employment, often is not taxed. As a result, middle-income working households bear more PIT burden, than the high-income working class. Moreover, the redistributive objectives did not realize, since in a large part of Asia-Pacific countries the PIT schedules are progressive only for certain types of income.

Furthermore, in many Asian developing countries face a problem of lack of effective tax-related infrastructure, i.e. accounting, auditing, data collection, etc., and also of limited opportunities for PIT administration. Combined with high level of corruption, this leads to the high administrative costs and high tax compliance costs of progressive personal income tax systems [31; 32, p. 7].

So, for example the average PIT revenue in Asian developing countries makes about 2% of GDP, which is or less than a quarter of OECD average (Figure 1).

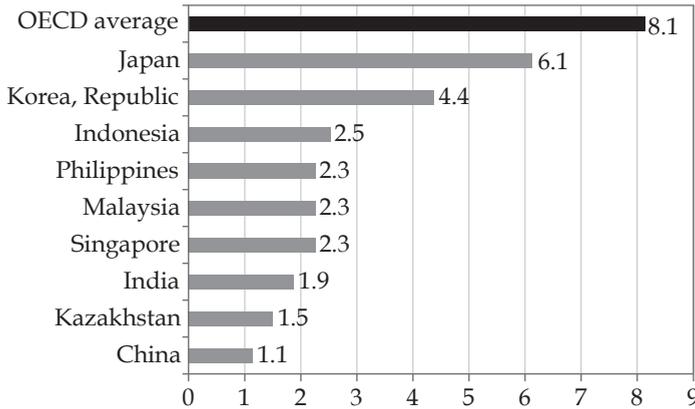


Figure 1. Personal income tax revenue in Asian countries and OECD average, % of GDP, 2015¹

Source: based on OECD, The World Bank, Bloomberg, Asian Development Bank, statistics of local revenue authorities [33]

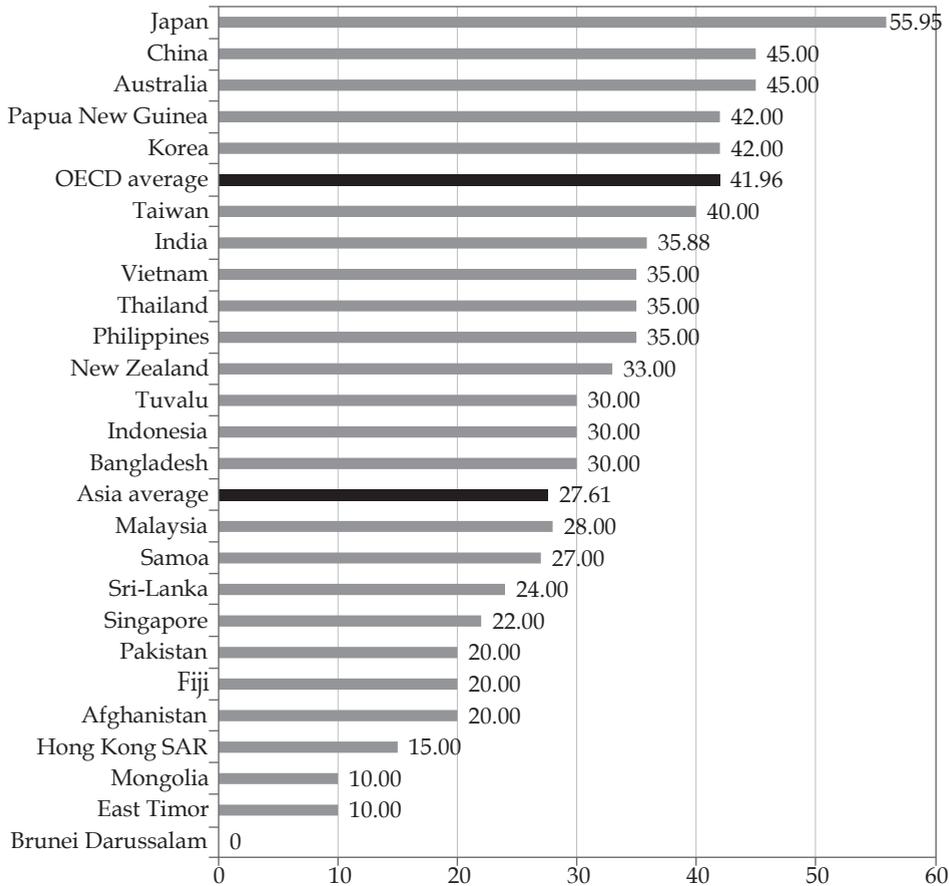


Figure 2. Personal income tax rates in East Asia and Pacific, and South Asia countries, 2018

Source: based on KPMG

¹ Here and henceforth we use the latest available data.

To compare, in Russia this value is 3.4% of GDP, which is higher than in developing Asian countries (on average by 1.4%), but lower than in developed economies in region (on average by 1.8%), and substantially lower than in advanced OCED economies (on 5%).

At the same time, Asian economies according to the global trend are reducing the PIT rates. From 1981 to 2015, in a number of Asia-Pacific countries the average top individual income tax rate was almost halved, achieving the level less than about a third of OECD average (Figure 2).

Figure 2 demonstrates that Japan has the highest top PIT rate, which exceeds Asian average by 28% and OECD average by almost 14%.

In Russia the personal income tax rate is 13%, but it should be taken into account that the government applies flat individual income tax scale, which does not provide various tax brackets, and hence, the opportunity to change the progressivity level by reducing tax rates for separate tax brackets.

One of the fundamental provisions of current tax theory suggests that reduction in tax rates with simultaneous enlargement of the tax base can improve the economic efficiency, reduce the level of inequality and economic distortions in order to move closer to the social equity.

Currently the PIT base in Asia-Pacific countries remains narrow due to two main contributing factors:

- the high threshold of exemption from individual income tax, and
- the presence of large informal sector in developing Asian countries.

The maximum ratios of such tax-free threshold/GNP per capita in Asia-Pacific countries are in Nepal and Pakistan – 3.8% and 3.95% respectively, while OECD average is 0.25%. The ratios in Cambodia, the Republic of Korea, and Japan are closer to this value.

The higher is such a threshold, the large number of individuals are exempted from paying PIT, and the higher are statutory tax rates, stated by government in order to finance public expenditure.

In addition, the individual income tax revenue depends on PIT design. For example, India has PIT thresholds (as a share of GNI) higher than in China, and slightly lower PIT rates (10–30% in India, and 3–45% in China). But in India the share of revenue from individual income tax makes 1.9% of GDP, while China collects only 1.1% of GDP.

The main reason of this difference is a comprehensive PIT model in India. This means that the individual income is taxed based on the aggregate value of all different income sources rather than on only a few income items as in China, where different income types are taxed separately [34, p. 187–189], whereby part of them are taxed by flat rate, another part – by progressive schedule, and several types of income are excluded from taxation at all.

Besides the informal sector, the narrowness of the tax base is determined by non-compliance and tax evasion of some high-income individuals through tax loopholes.

For example, in 2012 Federal Board of Revenue of Pakistan discovered that more than 1.5 million people, who had traveled abroad at least once a year, and about 0.5 million people, who had multiple bank accounts, are not registered as PIT payers. Moreover, only 90 members of the National Assembly of Pakistan (of 341) had filled annual tax returns [35, p. 10–12].

In Indonesia in 2010–2012 3% of households paid more than 80% of individual tax revenues. High- and middle-income households in often underreported their taxable personal income, while the self-employed persons were not covered by a withholding system. This resulted in difficulties to assess their taxable income. But a number of both administrative and economic measures, related to the improvement of registration of taxpayers led to the increase of the number of individual taxpayers from 3.25 million to almost 17 million people [32, p. 24].

The study of A. Claus et al. showed that individual income tax has the expected negative impact on income inequality. Moreover, this effect is significantly higher in Asian countries than in the rest of the

world. For example, the 1% increase in PIT rate in Asia reduces income inequality by around 0.573% compared with 0.041% in other countries worldwide. In other words, in Asia the marginal impact on income redistribution is higher than in other regions of the world. Such an effect is determined by above-mentioned factors: high tax-free thresholds and larger informal sector, notable informal unemployment.

The impact of progressive income tax scale on income redistribution is modest, and in several Asian countries is smaller than in the rest of the world. The 1% increase in PIT rate due to change in progressivity level reduces income inequality by around 0.002% in Asia compared with 0.005% in other countries worldwide [36, p. 187–190].

Figure 3 presents the results of comparative analysis of several Asia-Pacific countries, OECD average and Russia regarding the income inequality (Gini coefficient), personal income tax revenue and GDP per capita.

Figure 3 shows that Russia has similar values of GDP per capita and PIT revenue as Republic of Korea, but at the same time Gini coefficient in Russia exceeds Korean by 8% – this corresponds to the level of income inequality in Philippines and Indonesia.

Also Figure 3 demonstrates that countries with high GDP per capita have relatively high PIT revenues and low Gini coefficients. Except Singapore with high income inequality level (as in Malaysia, which is exceeded only by China and India), while having GDP per capita as in developed countries.

The reasons of such high income inequality in Singapore can be summarized as follows.

1. The patterns of economic development in the framework of globalization, which differ from those of USA, Taiwan, and Hong Kong. In 1960s–1970s, the industrialization strategy of Singapore focused on labor intensive manufacturing for the export market, while the small size of domestic market did not promote an import

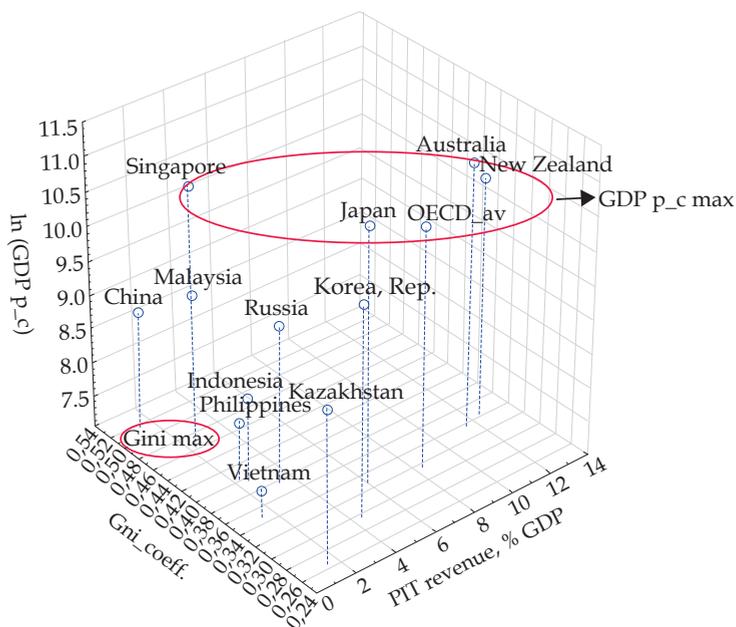


Figure 3. Income inequality, PIT revenue and GDP per capita in Asia-Pacific countries, OECD average and Russia, 2015

Note: $\ln(\text{GDP p}_c)$ is the natural logarithms of GDP per capita indicator

Source: based on OECD, The World Bank, Bloomberg, Asian Development Bank, statistics of local revenue authorities

substitution [37]. This led to the increase of inward foreign direct investment, and, as a consequence, to economic growth, reduction of unemployment and poverty. As a result, the high-skilled workers benefited all advantages on the labor market (workplaces, high salaries, social benefits etc.), while low-skilled and unskilled persons not only faced to the structural unemployment, but also had little time to adapt to the economic changes. And this gap has been increasing every year.

2. Policy of meritocracy in educational system. Under such scheme only bright pupils can benefit the entrance in high-rated country's universities. For other scholars the scope of universities to choose is limited.

3. Policy towards foreign workers, under which the high-skilled foreign workers from developed countries like Japan, USA, Western Europe are paid wages equivalent to their remuneration in their home country. While low-skilled and unskilled workers from developing and LDC countries like Bangladesh, India, Sri Lanka, and Philippines, receive salaries lower, that Singaporeans, having the same position.

4. Tax policy. The individual tax system in Singapore is progressive. Moreover, the low-income households do not pay any income tax and receive simultaneously the social services. The tax-free threshold is 20,000 SGD per year, while if the individual income exceeds 320,000 SGD per year, it is subject to the highest personal income tax rate – 22%².

The changes in Singapore's tax policy, which led to the increase of inequality, are the following.

Firstly, Singaporean government has never taxed capital gain, i.e. the rich can transfer a large part of their wealth to the next generation, raising the asset incomes of high-income households;

Secondly, the top marginal individual income tax rates have declined gradually

in 2004–2005 from 22% to 20% in order to encourage savings. Upper-middle income and high income households benefited more, than low-middle and low-income families from such a reduction of PIT base. Moreover, the interest income was exempted from individual income tax. As a result, in order to mitigate the negative effects on inequality, the government increased the top marginal PIT rate until 22% in 2016.

And finally, starting from 1960s–1970s, the corporate income tax has been gradually reduced from over 40% in the 1960s to 17% currently in order to attract foreign direct investment. To compensate the revenue losses, the Goods and Services Tax (GST) was introduced in 1994. It is a consumption tax on all goods and services, except sales or lease of property and financial services. Simultaneously with reduction in corporate and individual income tax rate, the GST rate has been gradually increased from 3% in 1994 to 7% currently. But like any other widespread direct consumption tax, GST is regressive in nature. It equally affects all consumption of high-income and low-income households, distorting the equity principle of taxation. And such a cumulative effect also contributed to the high income inequality in Singapore, compared to other Asian countries with high GDP per capita.

3. Empirical analysis

The purpose of the empirical analysis is to estimate the relationship between income inequality, individual income taxes and several labor market indicators in Asian countries. The methodology includes principal components analysis (PCA) and regression analysis.

At the first stage we use principal components analysis – the factor model in which the factors are based on summarizing the total variance. The computation of factors in PCA basically consists of diagonalizing a symmetric matrix: correlation matrix or covariance matrix. We use correlation matrix (Table 1) because variances of individual variables and units of measurement differ fundamentally.

² *Singapore Personal Income Tax Guide*. Available at: <https://www.guidemesingapore.com/business-guides/taxation-and-accounting/personal-tax/singapore-personal-income-tax-guide>

We introduced the last variable since several studies argued that the impact of tax policy on labor income depends on labor-market institutions, such as minimum wage laws, wage bargaining, and unemployment benefits (see for example [38; 39]).

Eigenvalue is the column sum of squared loadings for a factor, i.e., the latent root. It conceptually represents that amount of variance accounted for by a factor and it is calculated only for active variables.

Table 1 shows that the factor corresponding to the largest eigenvalue (1,340) accounts for approximately 66.99% of the total variance. The second factor corresponding to the second eigenvalue (0.660) accounts for approximately 33.01% of the total variance.

Figure 4 represents the plot of factor (PIT revenue and Gini coefficient) coordinates.

Because the current analysis is based on correlations, the largest factor coordinate that can occur is equal to 1.0; also, the

sum of all squared factor coordinates for a variable (i.e., squared correlations between the variable and all factors) cannot exceed 1.0. Figure 4 provides visual indication (scale) of how well each variable is represented by the current set of factors.

All analyzed variables, except self-employed workers, are positively related with personal income tax revenue: the larger is the share of self-employed, the smaller is the PIT revenue. This is especially true for developing countries in region.

Figure 4 also demonstrates the proximity of variables to the first factor – personal income tax revenue. The closer a variable is located to the unit circle, the better is its representation by the current coordinate system.

So, personal income tax revenue was chosen as dependent variable for the next stage of the analysis – determining variables with significant impact on individual income tax revenue in analyzed countries, by means of regression analysis.

Table 1

Correlation matrix and eigenvalues

	PIT_rev	Gini_coeff.	*LP	*SNGMW	*WSW	*SE	*LFI	Eigen	Total variance
PIT_rev	1.000000	-0.339707	0.712140	0.824718	0.447954	-0.381958	0.471208	1.340	66.99
Gini_coeff.	-0.339707	1.000000	-0.238370	-0.226671	-0.055715	-0.246534	0.024914	0.660	33.01
*LP	0.712140	-0.238370	1.000000	0.962222	0.753615	-0.598694	0.700804		
*SNGMW	0.824718	-0.226671	0.962222	1.000000	0.660711	-0.602753	0.666950		
*WSW	0.447954	-0.055715	0.753615	0.660711	1.000000	-0.811068	0.849999		
*SE	-0.381958	-0.246534	-0.598694	-0.602753	-0.811068	1.000000	-0.625265		
*LFI	0.471208	0.024914	0.700804	0.666950	0.784999	-0.625265	1.000000		

Explanatory notes:

* denotes supplementary variables

PIT_rev is an active variable, which denotes the share of revenue from personal income tax in GDP.

Gini_coeff. is an active variable, measuring income inequality.

LP – is the labor productivity, which according to the ILO definition represents the total volume of output (measured in terms of GDP) produced per unit of labor (measured in terms of the number of employed persons) during a given time period.

SNGMW denotes harmonized statutory nominal gross monthly minimum wage. According to ILO methodology, data are converted to a common currency, using exchange rates for the series in U.S. dollars and using 2011 purchasing power parity rates for the series in constant 2011 PPP \$.

WSW denotes wage and salaried workers, as a share of total employment, i.e. employees who work for employers in the public or private sector and receive compensation in forms of salary, wage, commission, or in kind that is not directly dependent upon the revenue of the unit for which they work.

SE denotes self-employed workers, as a share of total employment, i.e. workers who, working on their own account or with one or a few partners or in cooperative, hold the type of jobs defined as a “self-employment jobs” i.e. jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced. According to ILO methodology, self-employed workers include four sub-categories of employers, own-account workers, members of producers’ cooperatives, and contributing family workers.

LFI is the labor freedom index (estimated by the Heritage Foundation), characterizing the quality of labor market institutions, which is the quantitative measure considering different aspects of the legal and regulatory framework of a country’s labor market, notably ratio of minimum wage to the average value added per worker; hindrance to hiring additional workers; rigidity of hours; difficulty of firing redundant employees; legally mandated notice period, and mandatory severance pay.

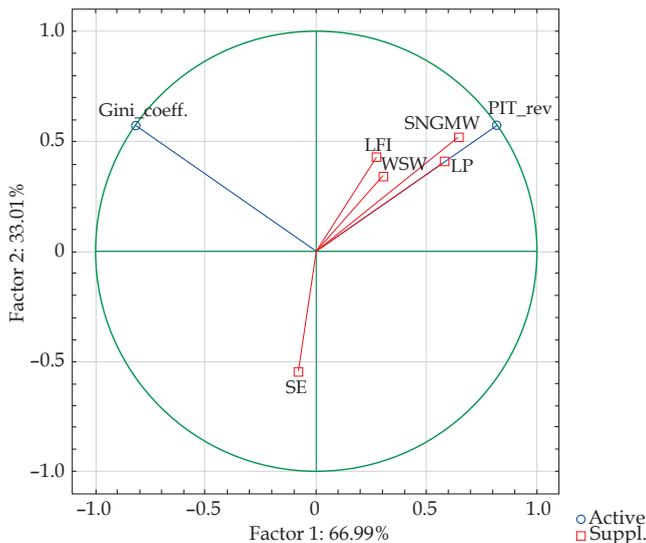


Figure 4. Projection on the variables on the factor-plane

The countries chosen for the analysis are Australia, China, Japan, Indonesia, Kazakhstan, Malaysia, New Zealand, Philippines, Republic of Korea, Singapore, and Vietnam. The choice of countries was limited by availability of comparable data. For developing, and especially, least-developed countries, the data on individual income tax revenue as well as other indicators of labor market are not available. The set of independent variables includes labor productivity, statutory nominal gross monthly minimum wage, share of wage and salaried workers, share of self-employed workers, and labor freedom index.

The results of regression analysis are presented in Table 2.

The Durbin-Watson statistic showed the absence of autocorrelation in residuals, and also the partial correlation for all independent variables is not significant, i.e. they do not correlate to each other.

Table 2 shows that for the chosen set of countries only statutory nominal gross monthly minimum wage has significant impact on individual income tax revenue.

The theoretical analysis suggested about high tax-free income thresholds in Asian developing countries that limit the positive impact of personal income tax progressivity.

Table 2

Regression summary, PIT revenue

	<i>b</i> *	Std.Err. of <i>b</i> *	<i>b</i>	Std.Err. of <i>b</i>	<i>t</i> (6)	<i>p</i> -value
SNGMW	2.74535	0.836889	0.0065	0.001985	3.28042	0.021944
LP	0.78128	0.523714	0.2067	0.138531	1.49180	0.195956
WSW	0.56339	0.356056	0.1309	0.082745	1.58231	0.174425
SE	-0.18158	0.299644	-0.0443	0.073093	-0.60597	0.570987
LFI	-2.05373	0.926643	-0.0003	0.000119	-2.21631	0.077487

R = 0.92239941

R² = 0.85082068

Adjusted R² = 0.70164136

F(5,5) = 5.7033

p < 0.03945

Std.Error of estimate: 2.2190

*b** and *b* denote the standardized regression coefficients and the raw regression coefficients respectively.

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Authors

Sergey A. Belozyorov — Doctor habil. (Economics), Professor, Head of the Department of Risk Management and Insurance, chief researcher of Laboratory of Asian Economic Studies, Saint Petersburg State University (62 Tchaikovskogo Str., 191123, Saint-Petersburg, Russian Federation); ORCID: [0000-0001-8711-2192](https://orcid.org/0000-0001-8711-2192); e-mail: s.belozerov@spbu.ru

Olena V. Sokolovska — PhD in Economics, Senior Researcher, leading researcher of Laboratory of Asian Economic Studies, Saint Petersburg State University (62 Tchaikovskogo Str., 191123, Saint-Petersburg, Russian Federation); ORCID: [0000-0002-4259-3786](https://orcid.org/0000-0002-4259-3786); e-mail: e.sokolovskaya@spbu.ru

Информация об авторах

Белозёров Сергей Анатольевич — доктор экономических наук, профессор, заведующий кафедрой управления рисками и страхования, главный научный сотрудник Лаборатории азиатских экономических исследований, Санкт-Петербургский государственный университет (191123, Россия, Санкт-Петербург, ул. Чайковского, 62); ORCID: [0000-0001-8711-2192](https://orcid.org/0000-0001-8711-2192); e-mail: s.belozerov@spbu.ru

Соколовская Елена Васильевна — кандидат экономических наук, старший научный сотрудник, ведущий научный сотрудник Лаборатории азиатских экономических исследований, Санкт-Петербургский государственный университет (191123, Россия, Санкт-Петербург, ул. Чайковского, 62); ORCID: [0000-0002-4259-3786](https://orcid.org/0000-0002-4259-3786); e-mail: e.sokolovskaya@spbu.ru

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