

1. Introduction

Whether cross-country income differences narrow over time has been a major question in the economics literature. On the other side, there is abundant evidence that gender equality helps countries attain more favorable economic outcomes by promoting women's economic inclusion. However, there has been a lack of effort to explore whether gender equality plays a role in bridging income differences across countries. This is an important question, since ensuring a level playing field for women can help poorer economies reach their true potential, and in turn catch up with the living standards in richer countries. The present paper examines this issue by focusing on one of the most visible bottlenecks for gender equality, i.e. gender discrimination in the law. It documents the remarkable progress across the globe toward legal gender equality since the 1970s, albeit to different extents, and finds that greater legal gender equality is associated with stronger income convergence across countries over time.

Gender inequalities in all corners of the world leave women economically disadvantaged, and in turn generate stark imbalances in economic outcomes. Although women account for half of the world's working-age population, they constitute only about a third of the labor force globally. About 700 million fewer women relative to men are in paid employment, and even when women are paid, they tend to be employed in less secure jobs with limited career prospects, poorer work conditions, and lower pay (UN 2016, Dabla-Norris and Kochhar 2019, Bertay et al. 2020). It is also well documented that women's inclusion in a wide range of economic activities, from participation in financial markets to asset ownership, remains much more limited compared to men.¹

The pervasive gender-based differences in economic outcomes make gender inequality, not only a matter of human rights, but also an economic phenomenon. Gains from providing a level playing field for women are striking. Recent studies estimate that the economic boost can be larger than a quarter of GDP for many developing economies, if existing barriers to women's economic inclusion are eliminated (Cuberes and Teignier 2016, Ostry et al. 2018). Therefore, women's full and effective participation in economic activities is a key to more favorable economic performance, and a priority in the development agenda, including the 2030 Agenda of Sustainable Development (IMF and World Bank 2007, World Bank 2012, UN 2015, IMF 2017).

¹ For instance, see World Bank (2012), Demirguc-Kunt et al. (2013), Blau and Kahn (2017), Demirguc-Kunt and Singer (2017), Delechat et al. (2018), Chen et al. (2021), Chiplunkar and Goldberg (2021), Guiso and Zaccaria (2021), Ke (2021).

The discussion on the positive effects of gender equality on economic growth and development goes back to, at least, Boserup (1970), with extensive supporting evidence.² The literature finds that gender equality fosters economic growth and development through various channels, including productivity growth, female labor force participation, accumulation of human capital, and efficiency of allocation in the labor market. There also exist indirect channels through which gender equality improves economic performance. For instance, working women likely invest more in education, food, and health of their children, which spurs the accumulation of human capital further in the longer term (e.g. Schultz 2002, World Bank 2012). Men and women complement each other in production with different skills and perspectives, including toward risk-taking and collaboration (Ostry et al. 2018). Moreover, women's economic inclusion can contribute to economic growth and development by promoting economic diversification, reducing income inequality, enhancing financial stability, improving competitiveness, and mitigating the negative effects of demographic shifts (Steinberg and Nakane 2012, WEF 2014, Gonzales et al. 2015, Kazanjian et al. 2016, Kochhar et al. 2017, Sahay and Cihak 2018). In summary, gender equality is a critical cog in the engine of inclusive, resilient, and sustainable economic growth.

In this regard, acting swiftly and decisively to combat gender discrimination and allow women to take part in economic activities freely can unlock a large but untapped economic opportunity by utilizing an underused source, women. This can be relevant to the process of bridging income differences across countries over time. In the economics literature, whether cross-country income differences narrow, persist, or widen, over time has been a major question.³ It is a matter of the degree to which less developed countries can achieve the living standards in the advanced economies. Greater gender equality can act as a catalyst in this process, since providing a level playing field allow women to fulfill their true potential, thereby enabling poorer economies to catch up with the richer ones.

A potential channel through which gender equality can facilitate cross-country income convergence over time is its positive impact on productivity growth.^{4,5} As discussed by the literature, gender equality likely affects the growth rate of productivity both through extensive and intensive margins (e.g. Bertay et al. 2020). In the extensive margin, the removal of barriers to women's economic empowerment translates into a greater share of women in the labor force, and thus a larger pool of talents available for recruiters, whereby increasing productivity growth. On the intensive margin, the effect can work through ensuring

² Among others, see Hill and King (1995), Dollar and Gatti (1999), Tzannatos (1999), Klasen (2000, 2002), Knowles et al. (2002), Lagerlof (2003), Abu-Ghaida and Klasen (2004), Esteve-Volart (2004), Klasen and Lamanna (2009), Duflo (2012), Elborgh-Woytek et al. (2013), Gonzales et al. (2015), Hakura et al. (2016), Kochhar et al. (2017), Hsieh et al. (2019), Bertay et al. (2020), Ouedraogo and Stenzel (2021).

³ Among others, see Solow (1956), Barro and Sala-i-Martin (1992), Islam (1995), Barro (1997, 2003).

⁴ Differences in productivity growth are found to be a major driver of cross-country income differences (e.g. Klenow and Rodriguez-Clare 1997, Easterly and Levine 2001).

⁵ In the context of the Solow model, the rate of convergence (λ) is an increasing function of the rate of change of "labor-augmenting productivity": $\lambda = (n + h + \delta)(1 - \alpha)$ where n is the growth rate of population, h is the growth rate of labor-augmenting productivity, δ is the depreciation rate of physical capital, and α is the elasticity of output to physical capital.

women's access to the occupations in which they could be more productive based on their own education and training, and appropriate incentives, such as a longer career ladder or higher pay. Moreover, eliminating existing obstacles for women to become entrepreneurs can foster the implementation of innovative ideas, which in turn contributes to productivity growth. Last but not least, equal access to education and health services on the basis of gender can also boost productivity.

A specific area that requires action to free this economic potential is the constraints on women's economic inclusion imposed by the laws that discriminate on the basis of gender (i.e. "gender discriminatory laws"), since gender inequality is not just a result of social norms or cultural attitudes but is also legitimized by the law around the globe (Christopherson et al. 2022). Many countries still uphold laws and regulations that discriminate against women throughout their work life. In some countries, women cannot get a job, start a business, travel without the husband's permission, or get access to credit. Such legal barriers to women's full and effective participation in economic activities limit the ability and capacity of economies to take advantage of a readily available opportunity by leaving women as an underutilized resource. This in turn could prevent economies from prospering, and leave them behind in the process of economic development.

Although discrimination against women in the law is one of the most obvious forms of gender inequality, it could indeed be actionable in the shorter term depending on the relevant local laws.⁶ However, there may be a concern regarding the extent to which de jure changes in gender discriminatory laws would translate into de facto improvements, since many other factors, such as social norms or cultural attitudes (which take a longer time to change) can shape those outcomes as well. Against this backdrop, the legal environment provides a backstop mechanism, and can serve as a trigger for the changes in informal codes (Williamson and Kerekes 2011, Aldashev et al. 2021, Christopherson et al. 2022). In addition, there exists extensive direct evidence that legal reforms supportive of gender equality yield desired economic outcomes. The literature finds that tackling gender-based legal impediments can generate positive consequences on various metrics of women's economic inclusion, such as labor force participation, starting businesses in the formal sector, asset ownership, financial inclusion, career prospects, and leadership positions.⁷ The positive associations between gender equality reforms and women's economic empowerment suggest that abolishing the laws that sideline women indeed pays off.

⁶ However, it is important to note that the process of reforms is not standard across countries in practice, and depends on the country-specific context. The complexity of the legal system, institutional arrangements, and traditions that the existing laws represent may make legal reforms toward gender equality more difficult to achieve. Therefore, the idea that different gender-based reforms can be undertaken smoothly and quickly may not be very reasonable in some cases. Christopherson et al. (2022) provides an excellent discussion on this issue with country-specific examples. Against this backdrop, though, many countries across the world adopted gender equality reforms that were perceived as infeasible before, as exemplified by the authors.

⁷ For instance, Khan (1996), Agarwal (2003), Combs (2005, 2006), Daley et al. (2010), Geddes et al. (2012), Deininger et al. (2013), Demirguc-Kunt et al. (2013), Gonzales et al. (2015), IMF (2015), Voena (2015), Crisman et al. (2016), Delechat et al. (2018), Hazan et al. (2019), Hyland et al. (2020a, 2020b, 2021), Hyland and Islam (2021).

Putting these links together, this paper sheds light on the role of legal gender equality, i.e. a legal framework wherein the laws do not discriminate on the basis of gender, in income convergence across countries over time. The data on inequalities in legislation are from the World Bank's Women, Business and the Law database. It captures inequalities in domestic laws and regulations throughout women's work life, from the time they enter the labor force through to their retirement. It focuses on eight aspects centered on women's participation in economic activities, including (i) mobility, (ii) protection in the workplace, (iii) pay, (iv) marriage, (v) parenthood, (vi) entrepreneurship, (vii) ownership of assets, and (viii) pension system. These areas cover the legal constraints that can lead to exclusion of women from the workforce to start with (restrictions on mobility, protection in workplace, obligations to husband for married women), gender-based disparities in earnings for the same work (laws regarding pay), unequal treatment of women when it comes to having a child (parenthood laws related to the pregnancy period and afterwards), obstacles for women to start their own business (laws on entrepreneurship), unfair treatment for asset ownership and inheritance (as spouses and children), as well as disadvantages on the basis of gender in the case of retirement benefits (pension laws).⁸

This paper first documents that there has been remarkable progress toward legal gender equality over the last five decades, albeit to different extents. Globally, on average, women had about half of the rights that men had in 1970, whereas this reached around three quarters in 2019. This, however, also reveals that the legal environment around the globe is still far from ensuring equal economic opportunities for women, intruding all aspects of their work life. Looking at a further breakdown, this ratio is even lower for the laws related to pay, parenthood, and pension. In addition, despite the wide-spread stride across the globe, the pace of change has been uneven across countries. As a result, cross-country gaps in gender discriminatory laws have persisted and even widened over the years. In some countries, women still have less than half of the legal rights relative to men, whereas some other countries have become much closer to legal gender equality by repealing gender discriminatory laws over the last fifty years.

The empirical results, based on a global sample over the last five decades, show that greater gender equality in the law catalyzes income convergence across countries. The size of the impact is economically significant. The estimates suggest that, as a country with, say, a 50% lower GDP per capita relative to its peers initially, climbs from the 25th to the 75th percentile of the sample,⁹ the growth rate of its per capita income becomes 0.3 percentage points higher per annum, on average during the subsequent five-year period. It is important to note that this gain is solely due to the additional convergence boost arising from a relatively higher gender equality in the law, and whereby allowing its income level to catch up with

⁸ Hyland et al. (2020b) provides a summary of the strands of the literature that show evidence on the relationship between each of these specific legal dimensions covered by the WBL index and women's economic empowerment.

⁹ In the sample, this corresponds to making progress toward gender equality by about a quarter. As an example, it means moving to a legal framework in which women have three quarters of the economic rights relative to men, where this ratio is one half to start with.

that of its peers at a higher pace. To put these numbers into a context, in Sub-Saharan Africa, average GDP per capita during the 2010s stood at about one fourth of that of the countries in Europe & Central Asia.¹⁰ This gap in levels suggests that, on average, the same amount of progress regarding legal gender equality in Sub-Saharan Africa could lead to around 0.4 percentage points higher per capita GDP growth in annual terms (thereby facilitating the process through which the income level in the region can catch up with that of Europe & Central Asia) driven by stronger convergence forces in a more gender-equal legal environment. These offer large gains in terms of economic growth and development, suggesting that as countries eliminate gender bias and discrimination in the law, they indeed reap the economic benefits through the convergence channel: Reforming the legal framework with a view to creating a level playing field for women can help poorer countries catch up with the living standards in richer economies.

Focusing on a further breakdown, gender-based legal impediments regarding workplace, pay, marriage, parenthood, and pension seem to be particularly important for income convergence. However, this does not mean that other aspects of the law are not relevant. Interlinkages and spillovers across different dimensions of gender discriminatory laws are crucial to take into consideration. For instance, if women are not allowed to leave their house same way as men (evaluated under the mobility indicator), the laws that prohibit discrimination in the workplace would not be very effective for women's economic inclusion in practice, since the former significantly restricts their capacity to enter the labor force in the first place. Therefore, the progress to tackle gender discriminatory laws should continue with a holistic view.

The implications of the findings are far-reaching in the post-pandemic period. The Covid-19 crisis has led to a large and widespread downturn in the global economy (IMF 2021). It also appears to exacerbate existing cross-country income gaps (Filippini and Yeyati 2021, IMF 2021), and gender imbalances within countries by affecting women disproportionately (Alon et al. 2020, Taneja et al. 2021, Christopherson et al. 2022). The results on the catalyst role of gender-equal laws in cross-country income convergence offer reasons for optimism by offering a window of opportunity for less developed countries: As they reform gender discriminatory laws, this can help them mitigate the scarring effects of the Covid-19 shock on economic growth and facilitate the process through which they can reach the living standards in their richer peers. Furthermore, tackling legal impediments to women's economic empowerment can alleviate the adverse impact of the pandemic on gender inequality, thereby setting the stage for an inclusive, resilient, and sustainable growth path going forward.

It is important, however, to acknowledge that reforms toward gender equality in the law are just a part of the overall process through which countries should ensure equal economic opportunities for women. Progress in all areas needs to be made. For instance, efforts to improve women's access to education,

¹⁰ The definition of "Europe & Central Asia" is adopted from the World Bank's classification, and excludes high income countries. See the Appendix for the list of countries in each group.

health, and financial services also affect economic performance (e.g. Klasen and Lamanna 2009, Jain-Chandra et al. 2018). In addition, as such efforts go hand in hand with the law, they can contribute to the pace and the degree of the translation of legal reforms (as covered by the present paper) into outcomes.¹¹ Therefore, ensuring a level playing field requires a multi-faceted approach which sometimes can take more time (such as changing social norms and cultural attitudes) relative to the removal of gender-based legal barriers. But, as noted before, reforming laws is a first step for many countries to kick-start, since it is most likely to be achievable in the shorter term. The present study shows that progress in that respect indeed bears fruit and yields better economic performance by facilitating cross-country income convergence. The findings being specific to the area of the law, therefore, provide a basis for optimism.

This paper contributes to the long literature on the effects of gender equality on growth and development (as cited above) by focusing on a related, but different question: Instead of the role of gender equality in explaining the size of cross-country differences in income as found by the previous studies, the present paper examines the extent to which gender equality shapes the evolution of those differences over time. There is an important distinction between the two. The objective of the former is to understand whether the living standards in a country improve if there exists greater gender equality. The latter, on the other hand, aims to explain whether some countries lead or lag in the process of economic development, depending on the degree of gender equality. Hence, beyond the role of gender equality in understanding current gaps in income across countries, the question this paper investigates is how it shapes the future of cross-country income differences and hence world income distribution, and whether it acts as a catalyst for bridging existing income gaps across countries over the longer term.

This paper also extends the extant literature on income convergence across countries (as cited above). There exists evidence on the presence of the convergence process whereby poorer countries tend to grow faster relative to the richer ones. The present paper adds to the literature by showing evidence that gender equality, specifically in the realm of the law, strengthens the convergence process.

The rest of this paper is organized as follows. **Section 2** explains the data and the variables. **Section 3** illustrates the stylized facts. **Section 4** introduces the empirical methodology. **Section 5** documents and discusses the results. Finally, **Section 6** concludes.

¹¹ In this context, the role of legal gender equality in cross-country income convergence, as found by this study, can be viewed as a lower bound.

2. Data

This section explains the data and the variables. For a brief description, see the Appendix (Table A1).

2.1. Gender discriminatory laws

Data on gender discriminatory laws are obtained from the World Bank's Women, Business and the Law (WBL) database, which is compiled by a large team of the World Bank's legal experts together with local experts, lawyers, judges, and public officials. It provides information on laws and regulations affecting women's economic inclusion around the globe since 1970. It has eight indicators focusing on different stages of women's work life, starting from the entry into the labor force through the retirement period. The indicators gauge the extent of gender-based discrimination in domestic laws on (i) mobility, (ii) workplace, (iii) pay, (iv) marriage, (v) parenthood, (vi) entrepreneurship, (vii) ownership of assets, and (viii) pension system.

The indicator *mobility* assesses the constraints on women's agency and freedom of movement which can shape their decision to participate in the labor force. *Workplace* provides information on the legal capacity of women to work, as well as the measures to prevent discrimination in the workplace. *Pay* evaluates the laws that impact the gender wage gap. *Marriage* is related to the legal limitations on women to marry and divorce, including the ability to be the head of household. The *parenthood* indicator relates to the bias in legislation affecting women's work life during and after pregnancy. *Entrepreneurship* focuses on whether women can legally start and run businesses. The *assets* indicator looks at gender discrimination in property and inheritance laws. Finally, *pension* covers the discrimination against women related to the laws on pension system.

For each of these eight indicators, a score is constructed based on the answers to 4, or 5, binary (Yes/No) questions.¹² Whenever there is a legal constraint on women (the answer to a question is "No"), that question is assigned 0. For the indicators where there exist 4 (5) questions in total, each answer pointing to gender equality adds 25 (20) points to the score. Therefore, each indicator has a score that ranges between 0 and 100, with higher values meaning greater gender equality in the corresponding aspect of the law. Once the scores for the individual indicators are constructed, the unweighted average of these eight scores is used to calculate the overall law score, so-called the WBL index.¹³ By construction, the overall law score is scaled between 0 and 100, with higher values indicating greater gender equality in the

¹² For the set of the questions under each indicator, see the Appendix.

¹³ Therefore, the WBL index, being the unweighted average of the individual scores, is calculated by assigning an equal importance to all eight indicators. This is indeed an assumption to be revisited below.

law. If the WBL index is 50, for instance, it means that women, on average, have half of the economic rights that men have, and an index of 100 indicates perfect equality between women and men.

It is worthwhile to note a few advantages and disadvantages of using the WBL database. First, binary answers are useful to quantify the scores, but they may miss some details, particularly for borderline situations and partial reforms. Second, the database evaluates the legal framework relying on various standardized assumptions which ensure the comparability across countries and time, with a caveat of narrower scope for some questions. Third, it focuses on the general population, and hence does not capture, if any, the restrictions on women in minority groups. Fourth, it only covers the legal barriers centered on the work life, while other laws and regulations (e.g. on girls' education, or marriage age) also play a role in women's empowerment, and can obstruct equal economic opportunities. Finally, as mentioned before, gender inequality is not only a product of formal laws. Although the unequal treatment of women in the law is one of the most salient forms of gender inequality, many other factors also impede the realization of gender equality (e.g. cultural and social norms, attitudes, de facto restrictions in some occupations, and enforcement and interpretation of the laws in the books). These factors are also crucial for gender equality reforms to achieve their goals in practice, but are not covered by the WBL database. For more details on these issues, see Hyland et al. (2020a, 2020b, 2021).

2.2. Other variables

The majority of the macroeconomic control variables is adopted from the World Bank's World Development Indicators (WDI) database. These include real per capita GDP (constant in 2015 US dollars and used in logarithm), exports as a share of GDP, inflation based on GDP deflator, and government expenditure as a share of GDP.

A de jure measure of capital account openness, the well-known index by Chinn and Ito (2006), is included in a separate test. It is a proxy for financial openness from a regulatory perspective, ranging from -2 to 2, with higher values meaning economies with more open financial systems. To gauge the level of financial development, the index from the IMF is adopted. It covers both financial institutions (banks, insurance companies, mutual funds, and pension funds) and markets (stock and bond markets) by accounting for the complex multidimensional nature of financial deepening, including depth, efficiency, access, and activity. It is coded between 0 and 100, with higher values indicating more developed financial systems.

A proxy for institutional quality, the constraints on executives, is obtained from the Center for Systemic Peace Polity V dataset. The index summarizes the degree of the institutionalized constraints on the decision-making of chief executives. Such constraints might be imposed by "accountability groups",

often legislatures in Western democracies, and a powerful and independent judiciary in many countries. It is coded between 0 and 7, with higher values meaning higher institutional quality.

Finally, in a separate test, gender equality is proxied by adolescent fertility rate (the number of births per 10000 women ages 15-19) obtained from the World Bank's WDI database.

2.3. Sample

The sample consists of advanced, emerging market and developing economies around the globe (see the Appendix for the list of countries). The period of the analysis is from 1970 to 2019. The annual data is transformed into ten non-overlapping 5-year periods, 1971-1975, 1976-1980, ..., 2011-2015, and 2016-2019, with the last period consisting of four years. The average growth of real per capita GDP is calculated within each 5-year period (in percentage points). All country-period observations are included in the analysis.

3. Stylized Facts

3.1. Gender discriminatory laws

This section documents several stylized facts regarding gender equality in the law around the world. **Figure 1** illustrates the findings. **Chart A** shows the evolution of gender discriminatory laws over the last five decades across the globe. There has been significant progress, on average. The mean value of the WBL index (overall law score) increased to about 76 in 2019, from 46 in 1970. That is, while women had less than half of the rights that men had in 1970, this marginally exceeded three quarters in 2019. It, however, also reveals that the unequal treatment of women in the law is still in place (the WBL index is far from 100 as of 2019).

Looking at the individual indicators, the progress in repealing gender discriminatory laws has been broad-based, but to different degrees across indicators (**Chart A**). The laws that relate to women's mobility started from a high level (76) in 1970, indicating the lowest level of gender inequality, relative to other indicators. It has shown modest progress during the last fifty years. The laws covering the workplace and parenthood started from lower levels (below 20) implying pervasive legal barriers to women's economic inclusion in 1970. Both dimensions have advanced over time toward being more gender-equal, while the progress in the workplace-related laws accelerated during the 2000s. As of 2019, women have slightly more than three-quarters of the rights that men have in terms of the laws regulating the workplace, while this ratio remains only around half when it comes to parenthood.

Focusing on the number of legal reforms per year, two waves of reforms took place during the 1990s and the 2000s around the globe (**Chart B**). Many countries showed progress during these periods (**Chart C**).¹⁴ However, despite the wide-spread progress over the last five decades, cross-country gaps in legislation did not narrow over the years. To uncover this fact, **Chart D** documents the evolution of various percentiles of the overall law score. While the advances were concentrated on the upper percentiles, the lower percentiles remained relatively stable, implying large and widening gaps in gender discriminatory laws across countries (also see **Figure A1** in the Appendix). **Chart E** supports this finding. The cross-country dispersion in the WBL index increased markedly, until recently. The standard deviation of the WBL index increased by a large 46% between 1970 and 2014 and declined by only 6% over the period of 2015-2019.

Chart F plots the distribution of the WBL index comparing the first and the last year of the analysis in order to examine these phenomena further. The visible shift of the distribution to the right from 1970 to 2019 provides a clear illustration of the wide-spread stride. For instance, there exist 113 countries in 2019 in which women have at least 75% of the economic rights that men have, while this was zero in 1970. In 19 countries, this ratio is lower than 50% as of 2019, whereas this was the case for 105 countries in 1970. In the meanwhile, though, the distribution has widened, indicating increasing cross-country gaps in gender-based legal constraints (consistent with **Chart D** and **Chart E**). Therefore, despite the compelling progress worldwide, many countries still have a long way to proceed to secure equal economic opportunities for women in the law.

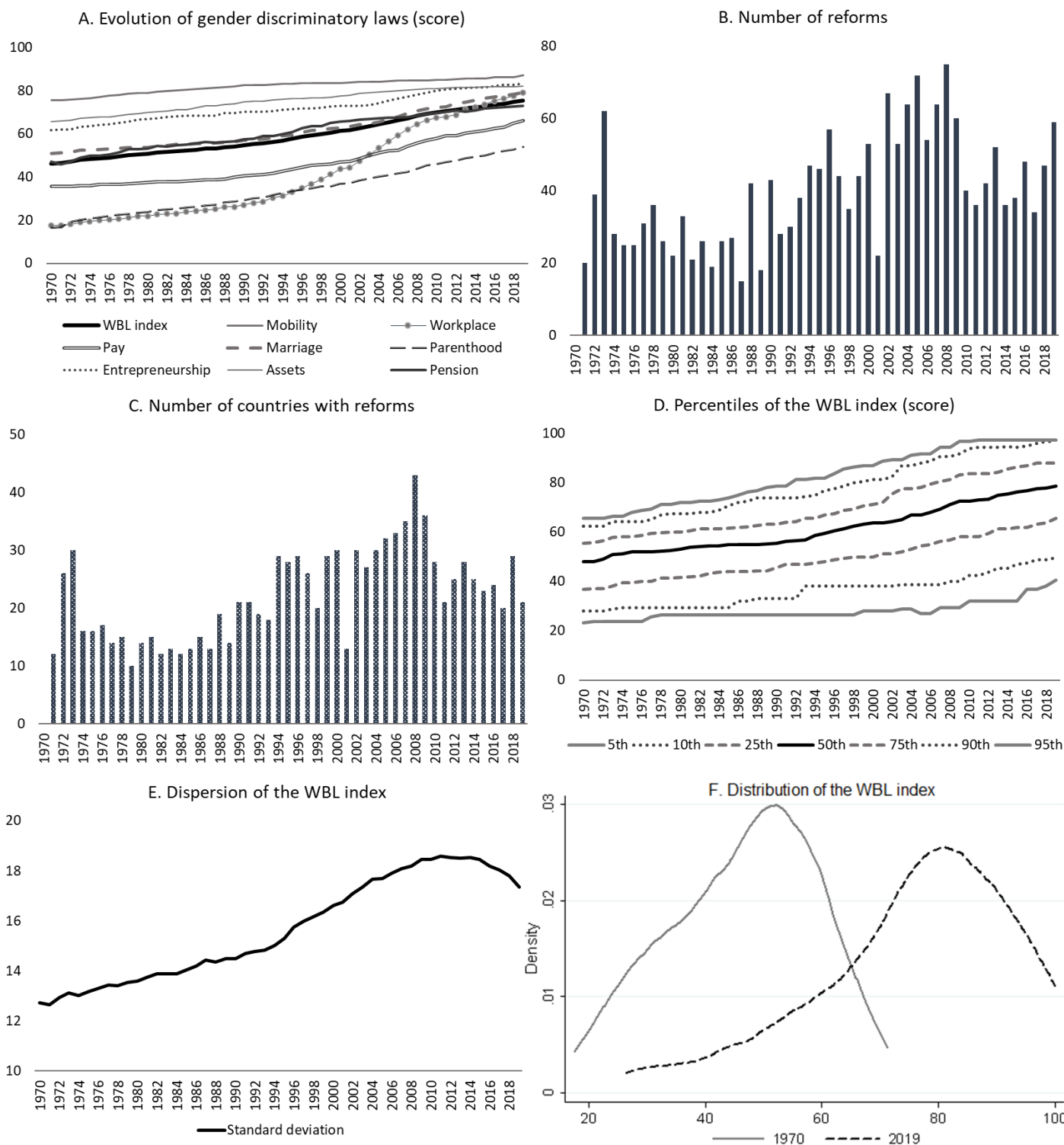
The progress also spread across different regions, but to different extents. **Chart A** in **Figure 2** shows that each region has moved toward legal gender equality, on average, during the last five decades. However, both the starting point and the rate of progress differed markedly across regions. For instance, in countries under High-Income OECD region, women had around 56% of the economic rights in the law compared to men in 1970, whereas this group of countries has leapt forward to almost full legal equality on the basis of gender over the last 50 years (with an average law score of 95 as of 2019). On the other side, Middle East and North Africa region started from a relatively low level with an average WBL index of 31 in 1970, and has been able to reach 49 as of 2019, with relatively modest progress. In Sub-Saharan Africa, the progress was more pronounced, with a large jump of the WBL index from 38 in 1970 to 71 in 2019. Finally, cross-country dispersion in gender discriminatory laws has widened within regions (**Chart B**). This means that, not only globally, but also at regional level, some countries have lagged their peers in the progress toward legal gender equality. An outstanding exception in this regard is the High-Income OECD

¹⁴ More broadly over the period of 1970-2019, an average country in the sample experienced around 10 reforms.

region, in which gaps in gender discriminatory laws have narrowed over time, particularly with the reforms during the 2000s.

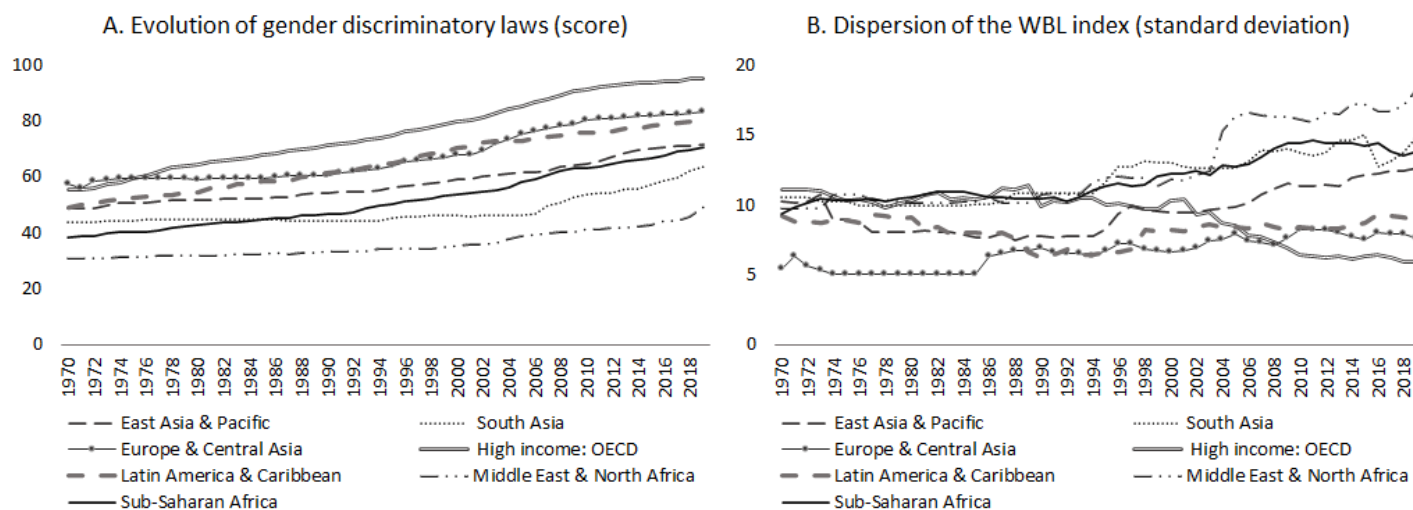
Finally, **Figure 3** documents the pairwise correlations between different indicators. It is interesting that the score regarding pension laws has the lowest correlation with the other indicators, in general. The indicator on the workplace has the highest correlation with the rest of the indicators. Marriage has a relatively high correlation (above 0.6) with the indicators of mobility and assets.

Figure 1: Gender discriminatory laws



Notes: IMF staff calculations. Law scores are from the World Bank’s WBL database. **Chart A** documents the evolution of the mean value of the eight indicators, as well as the WBL index. **Chart B** reports the number of legal reforms per year. **Chart C** shows the number of reforming countries per year. **Chart D** illustrates the evolution of the percentiles of the WBL index. **Chart E** shows the standard deviation of the WBL index over time. **Chart F** plots the distribution of the WBL index in 1970 and 2019.

Figure 2: Gender discriminatory laws in different regions



Notes: IMF staff calculations. Law scores and region definitions (shown in the Appendix) are from the World Bank’s WBL database. **Chart A** and **Chart B** document the evolution of the mean value and the standard deviation of the WBL index in each region, respectively.

Figure 3: Correlation between law indicators

Indicator	Mobility	Workplace	Pay	Marriage	Parenthood	Entrepreneurship	Assets	Pension
Mobility	1.00							
Workplace	0.39	1.00						
Pay	0.28	0.46	1.00					
Marriage	0.64	0.52	0.35	1.00				
Parenthood	0.38	0.48	0.17	0.33	1.00			
Entrepreneurship	0.18	0.48	0.19	0.32	0.24	1.00		
Assets	0.49	0.47	0.27	0.64	0.43	0.36	1.00	
Pension	0.00	0.22	0.31	0.11	0.11	0.13	0.07	1.00

Notes: IMF staff calculations. Law scores are from the World Bank’s WBL database.

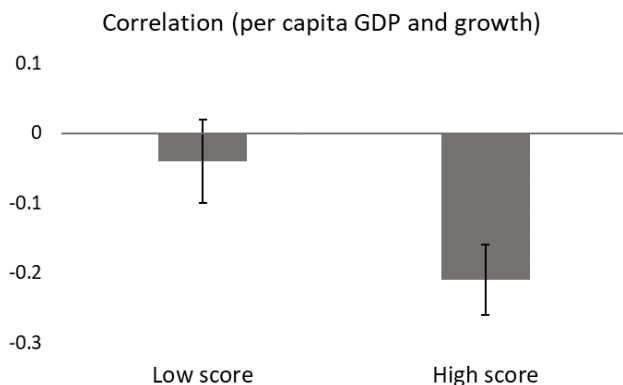
3.2. Legal gender equality and income convergence

Before introducing the empirical methodology, this section aims to explore whether there seems to be a relationship between legal gender equality and income convergence. In particular, I examine the association between initial GDP per capita and its growth rate during the following 5-year period, in cases where legal gender equality is relatively low and high. In general, if this relationship is negative, it means that poorer economies tend to grow at a higher pace compared to the richer ones, meaning cross-country income convergence over time (i.e. β -convergence). If this negative association is larger in size, say, in the case of higher legal gender equality, it indicates stronger convergence.

Figure 4 illustrates the findings. It reports the correlation between the beginning-of-period value of per capita GDP and its growth rate in the subsequent 5-year period in two subsamples. The first subsample consists of countries/periods with the WBL index being below the sample median (the first bar), i.e. where legal barriers to women’s participation in economic activities are more pronounced. The second subsample includes the cases where the overall law score is above the median value (the second bar), i.e. a relatively more gender-equal legal environment. To make sure that a few countries, or periods, do not drive the pattern, I obtain the residual growth rates which are estimated by regressing per capita GDP growth on country and period fixed effects.

The correlation between the growth rate of per capita GDP and its initial value is around -0.04 in the first subsample, where legal impediments to women’s economic empowerment are more pronounced. The correlation becomes -0.20 in the second subsample. A relatively stronger negative correlation in countries/periods with more gender-equal laws points to the fact that legal gender equality likely facilitates income convergence across countries over time. That is, poorer economies tend to grow faster (relative to the richer ones) whenever the legal framework is more gender-equal, compared to the cases with a higher degree of gender-based legal impediments. Motivated by these facts, I introduce the empirical methodology to shed light on this phenomenon more formally.

Figure 4: Legal gender equality and income convergence



Notes: IMF staff calculations. The WBL index (overall law score) from the World Bank’s WBL database is used for the analysis. Non-overlapping 5-year periods are used in line with the regressions. The sample is divided into two subsamples based on the median value of the beginning-of-period WBL index. High score corresponds to more gender-equal laws (above the median score). In each subsample, where the WBL index is low versus high, the correlation between the initial real GDP per capita and its subsequent rate of change is reported. Residual growth rates (net of country and period fixed effects) are used. Vertical lines represent the 90% confidence intervals.

4. Methodology

The goal is to examine whether legal gender equality is associated with stronger income convergence across countries over time. The annual data is transformed into nonoverlapping 5-year periods in line with the standard practice in the convergence literature.¹⁵ The specification is as follows:

$$\begin{aligned} \Delta GDP \text{ per capita}_{c,t} = & \beta_1 GDP \text{ per capita}_{c,t} + \beta_2 GDP \text{ per capita}_{c,t} \times Law \text{ score}_{c,t} \\ & + \beta_3 Law \text{ score}_{c,t} + \theta_c + \gamma_t + e_{c,t} \end{aligned} \quad (1)$$

where c and t stand for country and period, respectively. *GDP per capita* is the real per capita GDP in logarithm. The dependent variable $\Delta GDP \text{ per capita}_{c,t}$ is the average annual change of real per capita GDP over the period starting at year t (i.e. average annual growth rate between years $t + 1$ and $t + 5$), and $GDP \text{ per capita}_{c,t}$ is the beginning-of-period value (at year t). *Law score* $_{c,t}$ is a measure of legal gender equality, higher values meaning more gender-equal laws. It is obtained from the beginning of each period in order to alleviate a potential concern about reverse causality, since economic growth in coming years is not likely to trigger the legal reforms in the past. Country (θ_c) and time (γ_t) fixed effects control for time-invariant country-specific features and common period shocks which may affect the growth rate. Standard errors are clustered at the country-level.

In the absence of the interaction term ($GDP \text{ per capita}_{c,t} \times Law \text{ score}_{c,t}$), cross-country income convergence will be captured by β_1 . If there is convergence, β_1 must be negative, suggesting that per capita GDP tends to grow faster in countries/periods where it is lower in the first place. On the other side, $\beta_1 \approx 0$ indicates that cross-country income differences do not narrow over time, and $\beta_1 > 0$ means income divergence.

Nevertheless, in the current setup, there is a country-specific time-varying convergence parameter $\lambda_{c,t}$ that possibly depends on the law score:

$$\lambda_{c,t} = \beta_1 + \beta_2 Law \text{ score}_{c,t}$$

In this setup, per capita income exhibits convergence across countries over time, if and only if $\lambda_{c,t}$ is negative. Therefore, when β_1 is negative, if β_2 also turns out to be negative, there exists convergence regardless of the law score, and the pace of it increases as the law score becomes higher. This means that more (less) gender-equal laws promote (hinder) income convergence. If β_2 is around zero, it indicates that

¹⁵ The literature on convergence adopted this approach, e.g. Barro (1997, 2003). It is useful in the sense that it keeps within-country variation while smoothing out annual fluctuations, and also captures the medium term growth dynamics. I also show the results when the analysis is done at non-overlapping 10-year periods, or at the annual frequency.

income convergence is not much affected by gender discriminatory laws. Finally, whenever β_2 is found to be positive, both the presence and the strength of the convergence process depends on the law score, since more gender-equal laws weaken this convergence process. In this case, depending on the relative size of coefficient estimates for β_1 and β_2 , convergence can still be present at lower values of the law score (i.e. $\lambda_{c,t} < 0$). As laws become more gender-equal, though, convergence can become negligible (i.e. $\lambda_{c,t} \approx 0$), and eventually turn out to be divergence (i.e. $\lambda_{c,t} > 0$), indicating widening cross-country income gaps over time. I expect β_1 to be negative based on the previous evidence in the literature on income convergence, and β_2 to be negative to the extent that lower levels of gender discrimination in the law are associated with stronger convergence (as also suggested by **Figure 4**).

The direct effect of legal gender equality on economic growth is captured by β_3 . Although this is not the focus of this study, I expect β_3 to be positive, i.e. fewer legal impediments to women's economic inclusion to be associated with higher growth. As mentioned before, β_3 is useful to explain the size of income differences across countries. However, the convergence parameter $\lambda_{c,t}$, the main interest in the present study, explains how those cross-country income differences evolve over time, depending on discriminatory laws. I note that, since the specification in equation 1 accounts for the direct effect separately, it can disentangle the role of legal gender equality in convergence, above and beyond its direct impact.

There are two extensions to the specification in equation 1. First, although it controls for time-invariant country characteristics (θ_c) and the law score, it does not account for time-varying variables that may affect economic growth. To examine convergence conditional on those factors, the beginning-of-period value of various macroeconomic or institutional variables ($X_{c,t}$) is included. The specification is as follows:

$$\begin{aligned} \Delta GDP \text{ per capita}_{c,t} = & \beta_1 GDP \text{ per capita}_{c,t} + \beta_2 GDP \text{ per capita}_{c,t} \times Law \text{ score}_{c,t} \\ & + \beta_3 Law \text{ score}_{c,t} + \beta_4 X_{c,t} + \theta_c + \gamma_t + e_{c,t} \end{aligned} \quad (2)$$

Next, I examine whether the role of legal gender equality in income convergence remains similar when the potential effects of those country-specific characteristics on convergence are also accounted for. For this purpose, I extend the specification in equation 2 by adding the interaction between those variables and initial per capita GDP as follows:

$$\begin{aligned} \Delta GDP \text{ per capita}_{c,t} = & \beta_1 GDP \text{ per capita}_{c,t} + \beta_2 GDP \text{ per capita}_{c,t} \times Law \text{ score}_{c,t} \\ & + \beta_3 Law \text{ score}_{c,t} + \beta_4 X_{c,t} + \beta_5 GDP \text{ per capita}_{c,t} \times X_{c,t} + \theta_c + \gamma_t + e_{c,t} \end{aligned} \quad (3)$$

5. Results

5.1. Main results

Table 1 documents the main results on the role of legal gender equality in per capita income convergence. The first column employs the analysis at non-overlapping 5-year periods. To begin with, the coefficient estimate of the initial per capita GDP (β_1), being negative and statistically significant at the 1% level, shows that poorer economies tend to grow faster relative to the richer ones, meaning that per capita GDP exhibits convergence across countries over time (i.e. β -convergence).

Next, I switch to the main focus of the analysis, namely the extent to which legal gender equality shapes this convergence pattern. The coefficient estimate of the interaction term, $GDP\ per\ capita \times Law\ score$, i.e. β_2 , turns out to be negative and statistically significant at the 1% level. Together with the negative and statistically significant coefficient estimate for β_1 , this implies that (i) the estimated convergence parameter $\lambda_{c,t}$ is always negative in the sample; and (ii) it becomes larger in size as the law score increases. These mean that more (less) gender-equal laws are associated with stronger (weaker) income convergence across countries over time (consistent with **Figure 4**).

To evaluate the economic significance of the role of legal gender equality in convergence within the sample, I focus on the convergence parameter (λ) based on the coefficient estimates in the first column in **Table 1**. In particular, I estimate how much a country can gain through stronger convergence forces, as it moves from the 25th to the 75th percentile of the sample in terms of the law score. Note that this amounts to a jump with increasing the ratio of the rights that women have relative to men by about a quarter, since the 25th percentile of the law score corresponds to 47 (meaning that women have about the half of the rights compared to men), and the score is 73 at the 75th percentile (meaning that women have about three quarters of the rights relative to men). The difference in the estimated convergence parameter becomes 0.5 between the 25th and 75th percentiles of the WBL index ($\Delta\lambda^{75th-25th} = (73 - 47) \times 0.02 = 0.5$). This suggests that, as a country with, say, a 50% lower GDP per capita relative to its peers to start with, climbs from the 25th to the 75th percentile of the sample at that point in time, the growth rate of its per capita income would become 0.3 percentage points higher per annum ($0.5 \times 50\%$), on average during the subsequent five-year period. This gain is driven solely by a stronger convergence boost as a result of relatively more gender-equal laws.

To put these numbers into a context, in Sub-Saharan Africa, average GDP per capita during the 2010s remained at about 27% of (i.e. 73% lower than) that of the emerging market and developing economies in Europe & Central Asia, according to the data from the WDI database (see the Appendix for the list of countries). This income gap (together with the estimates in the first column in **Table 1**) means that, on average, the same amount of progress toward legal gender equality (by a quarter) in Sub-Saharan

Africa could lead to about 0.4 percentage points higher per capita GDP growth in annual terms (thereby facilitating the process through which its income can catch up with that of Europe & Central Asia) due to stronger convergence in a relatively more gender-equal legal environment. This corresponds to almost half of the average per capita GDP growth in Sub-Saharan Africa (1.1 percentage points) over the sample period.

I conclude that gender discriminatory laws, acting as a bottleneck in the process of bridging cross-country differences in income, yield significant economic losses. This is particularly the case for the countries/regions have been lagging behind their peers in the progress toward legal gender equality (as shown in **Figure 1** and **Figure 2**). As the others repeal gender discriminatory laws, it leaves the laggards (in terms of women's empowerment) economically behind, exacerbating cross-country income gaps over time. On the positive side, this offers a window of opportunity suggesting that much needed reforms toward gender equality in the law can help poorer countries unlock an important but untapped potential, and in turn, catch up with the living standards in the richer ones.

Table 1: Main results

Variable	5-year periods	10-year periods	Annual frequency
<i>GDP per capita</i>	-3.08*** (0.60)	-3.25*** (0.52)	-1.86*** (0.66)
<i>GDP per capita x Law score</i>	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)
<i>Law score</i>	0.17*** (0.05)	0.15*** (0.04)	0.19*** (0.05)
Country F.E.	Yes	Yes	Yes
Time F.E.	Yes	Yes	Yes
R-squared	0.37	0.56	0.15
Countries	182	180	185
Observations	1536	751	7615

Notes: IMF staff estimates. The results are based on equation 1. Columns 1, 2 and 3 employ the analysis using the data at non-overlapping 5-year periods, non-overlapping 10-year periods and the annual frequency, respectively. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

Although this is not the focus of this paper, the direct effect of legal gender equality on income is separately captured by this estimation, as mentioned before. The statistically significant and positive coefficient estimate of *Law score* suggests that abolishing laws that deprive women of equal economic rights as men is associated with higher growth in the medium term. As discussed above, however, the results in the present paper show the positive role of legal gender equality on growth is above and beyond this direct effect.

Finally, the second column in **Table 1** uses non-overlapping 10-year periods, and the last column runs the test using the data at the annual frequency. The results are consistent with the catalyst role of

gender-equal laws in convergence. For the rest of the paper, the analysis is done using non-overlapping 5-year periods in line with the first column.

5.2. Control variables

This section examines whether the role of legal gender equality in income convergence remains similar when it is tested conditional on a set of country-specific time-varying factors that may affect economic growth. **Table 2** illustrates the results. In columns 1-6, I control for financial openness, financial development, exports, inflation, government spending, and institutional quality, respectively. The results are similar across these tests.¹⁶ Greater financial openness, financial development and exports appear to be associated with higher economic growth.

Table 2: Control variables

Variable	Financial openness	Financial development	Exports	Inflation	Government spending	Institutional quality
<i>GDP per capita</i>	-2.69*** (0.50)	-3.02*** (0.64)	-3.94*** (0.87)	-3.50*** (0.71)	-3.34*** (0.83)	-2.61*** (0.60)
<i>GDP per capita x Law score</i>	-0.02*** (0.01)	-0.04*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.01*** (0.00)
<i>Law score</i>	0.16*** (0.05)	0.34*** (0.07)	0.14*** (0.05)	0.14*** (0.05)	0.13*** (0.05)	0.12*** (0.04)
<i>Control</i>	0.24** (0.11)	0.03** (0.02)	0.02** (0.01)	-0.00 (0.00)	-0.03 (0.03)	0.05 (0.05)
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.42	0.43	0.42	0.40	0.40	0.40
Countries	173	172	168	182	164	157
Observations	1349	1265	1343	1485	1296	1308

Notes: IMF staff estimates. The results are based on equation 2. Columns 1-6 control for the indicated variables. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

5.3. Alternative explanations

Although the analysis in **Section 5.2** controls for the direct effect of several macroeconomic and institutional factors on growth, it does not capture their potential impact on income convergence. This may raise a concern about whether the role of legal gender equality in income convergence can be explained by those factors. For instance, if countries that are financially more open have a relatively more-gender equal legal environment, the law score may be serving as a proxy for financial openness. If that is the case, the previous results may be driven by financial openness, rather than the law score. Therefore, it is

¹⁶ The findings also stay similar, (i) all controls are included together (although the sample in that case shrinks by almost half of the original sample); and (ii) if other macroeconomic variables (such as FDI inflows, current account balance, overall trade, imports, population size, government education expenditure, episodes of violent domestic conflicts, or a proxy for income inequality), are controlled for. Those results are available upon request.

important to examine whether the role of legal gender equality is still pronounced, if any, the role of other factors in convergence is accounted for.

To examine such alternative explanations, I test convergence based on the specification in equation 3. **Table 3** documents the results. I conclude that the concern about alternative explanations for the previous results is not very relevant empirically, since the catalyst role of legal gender equality in income convergence remains significant even after various competing channels are taken into account. Among those factors, financial development seems to contribute to convergence, whereas inflation has the opposite role.

Table 3: Alternative explanations

Variable	Financial Openness	Financial development	Exports	Inflation	Government spending	Institutional quality
<i>GDP per capita</i>	-2.84*** (0.54)	-3.72*** (0.64)	-3.94*** (0.87)	-3.55*** (0.69)	-3.10*** (0.84)	-2.63*** (0.63)
<i>GDP per capita x Law score</i>	-0.02*** (0.01)	-0.02*** (0.01)	-0.01** (0.01)	-0.01*** (0.00)	-0.01** (0.01)	-0.02*** (0.01)
<i>Law score</i>	0.14*** (0.05)	0.15** (0.07)	0.11** (0.05)	0.13*** (0.05)	0.11** (0.05)	0.13*** (0.05)
<i>GDP per capita x Control</i>	-0.08 (0.09)	-0.05*** (0.01)	-0.01 (0.01)	0.00*** (0.00)	-0.03 (0.02)	0.02 (0.06)
<i>Control</i>	0.88 (0.77)	0.45*** (0.09)	0.08* (0.05)	-0.01*** (0.00)	0.21 (0.15)	-0.12 (0.48)
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.42	0.44	0.42	0.40	0.40	0.40
Countries	173	172	168	182	164	157
Observations	1349	1265	1343	1485	1296	1308

Notes: IMF staff estimates. The results are based on equation 3. Columns 1-6 include the indicated control variables, as well as their interaction with the initial per capita GDP. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

5.4. Other tests

This section employs several checks. The first set of tests focuses on the indicator of gender discriminatory laws. **Table 4** documents the results. In the first column, the overall law score is calculated as the ratio of the number of questions indicating legal gender equality (i.e. answered as “Yes”) to the total number of answered questions, instead of using the WBL index. Therefore, each of 35 questions in the underlying data is assigned equal importance in terms of legal gender equality. By construction, this measure of the law score ranges between 0 and 1. The result stays similar.

In column 2, rather than the beginning-of-period level of the WBL index, the cumulative change from 1970 (until the beginning of each period) is adopted. The purpose of this test is to explore whether

there is only a level effect, or the overall progress toward legal gender equality in the past also matters for the strength of convergence going forward. The result shows the positive role of legal gender equality in convergence. Therefore, it is not only the level, but also the overall progress in the past, acting as a catalyst in bridging the future of cross-country income gaps.

Table 4: Alternative definitions of the law score

Variable	The ratio of the number of questions	The cumulative change
<i>GDP per capita</i>	-3.07*** (0.60)	-4.40*** (0.58)
<i>GDP per capita x Law score</i>	-1.77*** (0.50)	-0.03*** (0.01)
<i>Law score</i>	16.85*** (4.69)	0.26*** (0.06)
Country F.E.	Yes	Yes
Time F.E.	Yes	Yes
R-squared	0.37	0.41
Countries	182	182
Observations	1536	1431

Notes: IMF staff estimates. The results are based on equation 1. Columns 1-2 employ the indicated checks. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

Table 5 illustrates the next set of findings. In column 1, countries that are below the 5th and above the 95th percentile of the WBL index over the period of the analysis are excluded. The goal of this test is to make sure that a few countries that outperform, or underperform, the others regarding women's empowerment do not drive the previous results.

In the second column, the analysis is done using a weighted regression, where the weights are real GDP averaged over the sample period. This aims to address a potential concern on whether the results may only be driven by smaller economies. In column 3, I exclude the advanced economies (AEs) to examine the relationship in a sample consisting of the emerging market and developing economies. Column 4 adds country-specific time trends to the estimation, in order to absorb the effects of underlying trends on growth. The results stay similar.

In the last column, I estimate an alternative version of equation 1 where both the growth rate and the initial level of per capita GDP is defined relative to the US (by dropping the US from the sample). Hence, this test investigates a slightly different question, i.e. whether per capita GDP grows at a higher pace (relative to the US) in countries that are initially further away from the US in terms of economic development. The role of legal gender equality in convergence remains similar.

Table 5: Additional checks

Variable	Dropping the extremes	Weighted	Dropping the AEs	Country trends	Distance to the US
<i>GDP per capita</i>	-3.13*** (0.64)	-2.93*** (0.64)	-3.08*** (0.68)	-9.10*** (1.27)	-2.86*** (0.61)
<i>GDP per capita x Law score</i>	-0.02*** (0.01)	-0.02*** (0.01)	-0.02** (0.01)	-0.05*** (0.02)	-0.02*** (0.01)
<i>Law score</i>	0.16*** (0.05)	0.17*** (0.05)	0.17** (0.07)	0.44*** (0.13)	-0.03 (0.02)
Country F.E.	Yes	Yes	Yes	Yes	Yes
Time F.E.	Yes	Yes	Yes	Yes	Yes
R-squared	0.37	0.37	0.36	0.60	0.40
Countries	164	182	146	182	181
Observations	1410	1536	1241	1536	1526

Notes: IMF staff estimates. The results are based on equation 1. Columns 1-5 employ the indicated robustness checks. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

The results are also robust to (i) winsorizing the law score at the 5th-95th percentiles; (ii) winsorizing the GDP growth rate at the 5th-95th percentiles; (iii) dropping the smallest and/or the largest economies below the 5th and above the 95th percentiles of the GDP distribution over the sample period; (iv) excluding the poorest and/or the richest economies below the 5th and above the 95th percentiles of the per capita GDP distribution over the sample period; (v) weighting with population averaged over the sample period, instead of GDP, in order to increase the influence of more populous countries; (vi) dropping one region at a time; (vii) starting the analysis from later periods (e.g. the 1980s, or the 1990s); (viii) excluding the last period which has four years of data, instead of five; and (ix) non-clustered standard errors. Those results are available upon request. In the Appendix in **Table A3**, I also examine convergence across countries in a specific region, namely Sub-Saharan Africa, given the large number of countries in the region. The role of legal gender equality in cross-country income convergence stays similar.

Finally, although the present paper specifically focuses on the role of legal gender equality in convergence, it is sensible to check whether the result stays similar when gender equality is considered more broadly. To examine this, I adopt adolescent fertility rate as an inverse proxy for gender equality (since it is available for a long time period for a large set of countries). **Table A4** in the Appendix shows that a lower adolescent fertility rate is also related to stronger income convergence across countries over time. This supports the reasoning that the removal of gender discrimination in the law can promote gender equality in the society, which in turn facilitates convergence.

5.5. Different indicators of gender discriminatory laws

As mentioned before, the overall law score (WBL index) is calculated as the unweighted average of the scores from eight indicators, namely, the laws covering (i) mobility, (ii) workplace, (iii) pay, (iv) marriage, (v) parenthood, (vi) entrepreneurship, (vii) ownership of assets, and (viii) pension. This might mask some interesting facts, since different aspects of legal impediments to women's participation in economic activities may have distinct consequences. In this regard, this section first examines whether it might be only one specific indicator of gender discriminatory laws driving the previous results. Next, it explores which dimensions of the law might be more relevant to income convergence.

Table 6 represents the results when the overall law score is calculated by excluding one indicator at a time. In other words, in each column, the WBL index is the unweighted average of the remaining seven indicators. The result on the positive role of gender equality in the law in cross-country income convergence does not change much, meaning that the previous findings are not driven by only one dimension of the law.

Table 6: Excluding an indicator of gender discriminatory laws at a time

Variable	Excluded indicator:							
	Mobility	Workplace	Pay	Marriage	Parent	Entrepreneur	Asset	Pension
<i>GDP per capita</i>	-3.13*** (0.58)	-2.95*** (0.63)	-3.13*** (0.58)	-3.07*** (0.62)	-3.14*** (0.61)	-3.02*** (0.61)	-3.11*** (0.60)	-3.23*** (0.58)
<i>GDP per capita x Law score</i>	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)	-0.02*** (0.01)
<i>Law score</i>	0.17*** (0.04)	0.18*** (0.05)	0.18*** (0.05)	0.17*** (0.05)	0.14*** (0.05)	0.15*** (0.05)	0.17*** (0.05)	0.14*** (0.04)
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37
Countries	182	182	182	182	182	182	182	182
Observations	1536	1536	1536	1536	1536	1536	1536	1536

Notes: IMF staff estimates. The results are based on equation 1. Columns 1-8 employ the analysis using the law score that is calculated by excluding the indicated indicator. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

Next, **Table 7** employs the analysis by adopting the individual indicators, instead of the overall law score (i.e. WBL index). The results suggest that legal constraints on women regarding the workplace, pay, marriage, parenthood and pension are particularly relevant to convergence. It is important to note that these are mainly the areas in which gender discrimination in the law seems more pronounced on average (**Figure 1**). A noteworthy caveat of this analysis, though, is that it ignores the positive impacts of the reforms in an indicator on the effectiveness of others. For instance, if women are not allowed to leave their house same way as men (a question under mobility), the laws prohibiting discrimination in the workplace, or enabling

women to open businesses, would not be very effective for women's economic inclusion, since the former significantly restrains their capacity to get into the labor force in the first place.¹⁷ Therefore, these findings should not be interpreted as some aspects of the law are not important for the convergence process. The progress to tackle gender discriminatory laws should continue with a holistic view.

Table 7: Different indicators of gender discriminatory laws

Variable	Mobility	Workplace	Pay	Marriage	Parent	Entrepreneur	Asset	Pension
GDP per capita	-5.13*** (0.89)	-3.75*** (0.52)	-3.55*** (0.60)	-3.59*** (0.52)	-3.66*** (0.50)	-4.01*** (0.46)	-3.69*** (0.57)	-3.22*** (0.61)
GDP per capita x Law score	-0.01 (0.01)	-0.01*** (0.00)	-0.01*** (0.00)	-0.01* (0.01)	-0.02*** (0.00)	-0.00 (0.00)	-0.01 (0.00)	-0.01*** (0.00)
Law score	0.10 (0.09)	0.07*** (0.02)	0.11*** (0.03)	0.08 (0.05)	0.15*** (0.04)	0.01 (0.03)	0.04 (0.04)	0.13*** (0.04)
Country F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time F.E.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.36	0.37	0.37	0.36	0.37	0.36	0.36	0.37
Countries	182	182	182	182	182	182	182	182
Observations	1536	1536	1536	1536	1536	1536	1536	1536

Notes: IMF staff estimates. The results are based on equation 1. Columns 1-8 employ the analysis using the score for the corresponding indicator of gender discriminatory laws. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1

6. Conclusion

Gender equality in its own right is a major development goal but is also an imperative economic issue. One of the most salient barriers to gender equality is the discrimination in the law, which is potentially actionable in the shorter term. This paper shows that there has been remarkable progress in abolishing gender-based legal discrimination over the last five decades, but the playing field is still far from level. Laws sidelining women are still in place, impeding the realization of gender equality and leaving women economically disadvantaged. Moreover, cross-country gaps in discriminatory laws have persisted, and even widened since the 1970s. While some countries have significantly moved toward gender equality through legal reforms, ensuring equal economic opportunities for women in the law seems elusive in many countries around the globe.

The removal of prevalent legal barriers to women's economic inclusion can allow them to fulfil their true potential, and hence help countries leap forward in the process of economic development. This can have implications for the future of income differences across countries by bridging existing cross-country gaps over the longer term. This paper sheds light on this phenomenon based on the global data over the

¹⁷ Another caveat of this analysis is that some indicators do not have much variation over time and across countries. An example is the mobility indicator, since it already started from a relatively high level in many countries, as highlighted before.

last fifty years. It shows that more gender-equal laws facilitate income convergence across countries over time, thereby mitigating income inequality across countries. The results point to large economic gains from moving toward legal gender equality through the convergence channel. These call for action, and provide a reason to be optimistic going forward. They imply that legal reforms supportive of gender equality can help poorer countries catch up with the living standards in the advanced economies.

These have critical implications in the post-Covid-19 period, since the pandemic likely had scarring effects on economic growth, exacerbated cross-country income differences, and also deepened gender imbalances within countries. To mitigate the adverse effects of the pandemic on those outcomes, countries should strive to reform gender discriminatory laws with a view to guaranteeing legal equality for women in all dimensions.

Appendix

Variables and summary statistics

Table A1 provides a brief description of the variables. For more details see Section 2. Table A2 documents the summary statistics of the variables as used in the analysis.

Table A1: Description of the variables

Variable	Explanation	Source
WBL index	The overall score for gender discriminatory laws	WBL
Mobility	An indicator of gender discriminatory laws	WBL
Workplace	An indicator of gender discriminatory laws	WBL
Pay	An indicator of gender discriminatory laws	WBL
Marriage	An indicator of gender discriminatory laws	WBL
Parenthood	An indicator of gender discriminatory laws	WBL
Entrepreneurship	An indicator of gender discriminatory laws	WBL
Assets	An indicator of gender discriminatory laws	WBL
Pension	An indicator of gender discriminatory laws	WBL
Adolescent fertility	Births per 10000 women ages 15 to 19	WDI
GDP per capita	Constant in 2015 US dollars	WDI
Exports	As a share of GDP	WDI
Inflation	Based on GDP deflator	WDI
Government spending	As a share of GDP	WDI
Financial openness	Capital account openness index	Chinn and Ito (2006)
Financial development	A multidimensional index	IMF
Institutional quality	Constraints on executives	Polity V

Table A2: Summary statistics

Variable	25 th ptile	Median	Mean	75 th ptile	Std. dev.	Observations
WBL index	46.9	59.4	59.5	72.5	18.1	1536
Mobility	75	100	81.6	100	25.7	1536
Workplace	25	25	41.2	50	32.8	1536
Pay	25	50	47.4	75	29.8	1536
Marriage	40	80	61.6	80	29.4	1536
Parenthood	0	20	33.8	60	29.8	1536
Entrepreneurship	75	75	71.2	75	22.4	1536
Assets	60	80	74.7	100	27.7	1536
Pension	50	75	64.5	75	27.3	1536
Adolescent fertility	2.6	6.5	7.4	10.9	5.5	1501
GDP per capita growth	0.2	1.8	1.8	3.5	3.6	1536
Log(GDP per capita)	7.2	8.2	8.3	9.3	1.5	1536
Exports	19.1	29.7	36.6	47.1	27.3	1343
Inflation	2.4	6.3	36.7	13.6	401.9	1485
Government spending	11.3	15.2	15.9	19.1	7.8	1296
Financial openness	-1	0	0.1	1	1.4	1349
Financial development	11	20	26.9	37	21	1265
Institutional quality	2	5	4.4	7	2.4	1308

Law indicators in the WBL database

The sets of questions in each indicator of gender discriminatory laws are represented below (as taken from Table A.1 in the [Data Notes](#) of the World Bank's WBL database).

Mobility (0-100): Can a woman choose where to live in the same way as a man? Can a woman travel outside her home in the same way as a man? Can a woman apply for a passport in the same way as a man? Can a woman travel outside the country in the same way as a man?

Workplace (0-100): Can a woman get a job in the same way as a man? Does the law prohibit discrimination in employment based on gender? Is there legislation on sexual harassment in employment? Are there criminal penalties or civil remedies for sexual harassment in employment?

Pay (0-100): Does the law mandate equal remuneration for work of equal value? Can a woman work at night in the same way as a man? Can a woman work in a job deemed dangerous in the same way as a man? Can a woman work in an industrial job in the same way as a man?

Marriage (0-100): Is there no legal provision that requires a married woman to obey her husband? Can a woman be head of household in the same way as a man? Is there legislation specifically addressing domestic violence? Can a woman obtain a judgment of divorce in the same way as a man? Does a woman have the same rights to remarry as a man?

Parenthood (0-100): Is paid leave of at least 14 weeks available to mothers? Does the government administer 100% of maternity leave benefits? Is paid leave available to fathers? Is there paid parental leave? Is dismissal of pregnant workers prohibited?

Entrepreneurship (0-100): Does the law prohibit discrimination in access to credit based on gender? Can a woman sign a contract in the same way as a man? Can a woman register a business in the same way as a man? Can a woman open a bank account in the same way as a man?

Assets (0-100): Do men and women have equal ownership rights to immovable property? Do sons and daughters have equal rights to inherit assets from their parents? Do male and female surviving spouses have equal rights to inherit assets? Does the law grant spouses equal administrative authority over assets during marriage? Does the law provide for the valuation of nonmonetary contributions?

Pension (0-100): Is the age at which men and women can retire with full pension benefits the same? Is the age at which men and women can retire with partial pension benefits the same? Is the mandatory retirement age for men and women the same? Are periods of absence due to childcare accounted for in pension benefits?

Countries and regions in the WBL database

Country names and the corresponding region classifications are taken from the WBL database, and as follows:

East Asia & Pacific: Brunei Darussalam, China, Fiji, Micronesia, Fed. Sts., Hong Kong SAR, China, Indonesia, Cambodia, Kiribati, Lao PDR, Marshall Islands, Myanmar, Mongolia, Malaysia, Philippines, Palau, Papua New Guinea, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Taiwan, China, Vietnam, Vanuatu, Samoa.

South Asia: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka.

Europe & Central Asia: Albania, Armenia, Azerbaijan, Bulgaria, Bosnia and Herzegovina, Belarus, Cyprus, Georgia, Croatia, Kazakhstan, Kyrgyz Republic, Moldova, North Macedonia, Montenegro, Romania, Russian Federation, San Marino, Serbia, Tajikistan, Turkey, Ukraine, Uzbekistan, Kosovo.

High-Income OECD: Australia, Austria, Belgium, Canada, Switzerland, Chile, Czechia, Germany, Denmark, Spain, Estonia, Finland, France, United Kingdom, Greece, Hungary, Ireland, Iceland, Israel, Italy, Japan, Korea, Rep., Lithuania, Luxembourg, Latvia, Netherlands, Norway, New Zealand, Poland, Portugal, Slovak Republic, Slovenia, Sweden, United States.

Latin America & Caribbean: Argentina, Antigua and Barbuda, Bahamas, Belize, Bolivia, Brazil, Barbados, Colombia, Costa Rica, Dominica, Dominican Republic, Ecuador, Grenada, Guatemala, Guyana, Honduras, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, Mexico, Nicaragua, Panama, Peru, Puerto Rico (U.S.), Paraguay, El Salvador, Suriname, Trinidad and Tobago, Uruguay, St. Vincent and the Grenadines, Venezuela, RB.

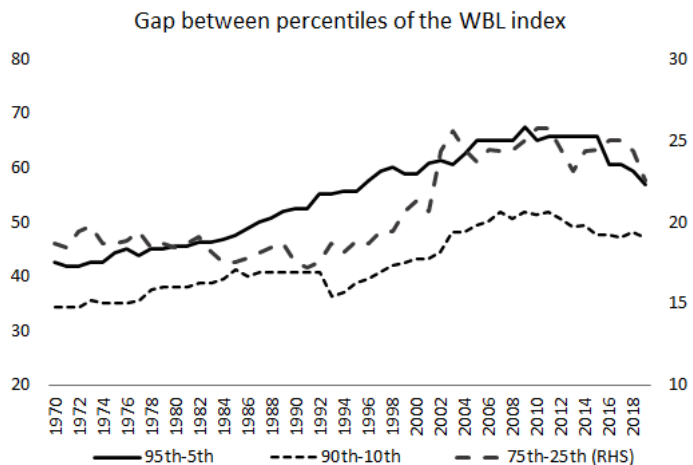
Middle East & North Africa: United Arab Emirates, Bahrain, Djibouti, Algeria, Egypt, Arab Rep., Iran, Islamic Rep., Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Malta, Oman, Qatar, Saudi Arabia, Syrian Arab Republic, Tunisia, Yemen, Rep.

Sub-Saharan Africa: Angola, Burundi, Benin, Burkina Faso, Botswana, Central African Republic, Côte d'Ivoire, Cameroon, Congo, Dem. Rep., Congo, Rep., Comoros, Cabo Verde, Eritrea, Ethiopia, Gabon, Ghana, Guinea, Gambia, Guinea-Bissau, Equatorial Guinea, Kenya, Liberia, Lesotho, Madagascar, Mali, Mozambique, Mauritania, Mauritius, Malawi, Namibia, Niger, Nigeria, Rwanda, Sudan, Senegal, Sierra Leone, Somalia, South Sudan, São Tomé and Príncipe, Eswatini, Seychelles, Chad, Togo, Tanzania, Uganda, South Africa, Zambia, Zimbabwe.

Gap between different percentiles of the WBL index

Figure A1 documents the evolution of differences between various percentiles of the WBL index over time.

Figure A1: Gap between different percentiles of the WBL index



Notes: IMF staff calculations. Law scores are from the World Bank’s WBL database. Chart documents the evolution of differences between various percentiles of the WBL index.

Legal gender equality and convergence in Sub-Saharan Africa

I test convergence across the countries in a specific region, namely Sub-Saharan Africa (SSA). Given the large number of countries in the region, strong progress toward legal gender equality, and relatively low level of economic development, it may be sensible to test if legal gender equality helps the poorer countries of the region catch up with the relatively more developed SSA peers. **Table A3** shows that the result on the catalyst role of gender-equal laws in income convergence is similar within SSA countries.

Table A3: Legal gender equality and income convergence in Africa

Variable	SSA region
<i>GDP per capita</i>	-2.51*** (0.76)
<i>GDP per capita x Law score</i>	-0.03** (0.02)
<i>Law score</i>	0.28** (0.13)
Country F.E.	Yes
Time F.E.	Yes
R-squared	0.39
Countries	45
Observations	409

Notes: IMF staff estimates. The results are based on equation 1. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

Gender equality proxied by adolescent fertility rate

I test the role of gender equality in convergence by adopting adolescent fertility as an inverse proxy. **Table A4** illustrates the result. It shows that lower levels of adolescent fertility (the number of births per 10000 women ages 15 to 19), indicating higher gender equality, are associated with stronger convergence.

Table A4: Gender equality and income convergence

Variable	Adolescent fertility as a proxy
<i>GDP per capita</i>	-4.79*** (0.66)
<i>GDP per capita x Adolescent fertility</i>	0.08*** (0.03)
<i>Adolescent fertility</i>	-0.51** (0.25)
Country F.E.	Yes
Time F.E.	Yes
R-squared	0.36
Countries	176
Observations	1501

Notes: IMF staff estimates. The results are based on equation 1. Standard errors in parentheses are clustered at the country-level. *** p < 0.01, ** p < 0.05, * p < 0.1.

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