PRODUCTIVITY DIFFERENTIANTION ALONG THE DEVELOPMENT PROCESS[1]

updated but still preliminary version

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Abstract

“Firms are different”, and everyone knows it by direct experience: tendency toward a productivity differentiation is a consequence of the fact that, generally speaking, new goods and new processes are continuously introduced in the market. Nevertheless imitation and firm selection tend to act as counter-balancing forces.

It is possible to imagine that forces enlarging firm differences (in term of productivity) act stronger in a developing catching-up countries, and that, contemporaneously, the selection process is weaker in these same economies. Moreover there are also a fragmentary empirical indications suggesting that productivity differentiation among firms/sectors is effectively higher in poorer countries.

This paper is a step to empirically deep this question in more general terms.

Introduction

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Firms are different: factors fostering and limiting productivity differentiation

General considerations

“Firms are different”, and everyone knows it by direct experience; nevertheless, the stress on the "representative firm" and the lack of microdata relegated firm differentiation to minor or not explicit research fields until very recent times, even if with notable exceptions (as an example, the Schumpeterian analysis of technological competition, in which firm/product differentiation plays a central role).

Nevertheless, it is well known that in the recent past the share of investigation based on micro-data at firm and/or plant level has grown spectacularly. One outcome of this stream of analysis has pointed out that firms are effectively different, and a specific perspective through which firm differentiation has been analyzed is productivity differentiation.

A big bulk of literature and many authors have documented "virtually without exception, enormous and persistent measured productivity differences across producers, even within narrowly defined industries". (Syverson 2011, p. 326); these differences have been then largely analyzed and investigated (Bartelsman, Haltiwanger, and Scarpetta, 2004 and 2013; Ito K., Lechevalier S., 2010)

A relevant share of this literature also focussed in trade, after some seminal papers (Melitz, 2003; Helpman, Melitz, Yeaple, 2003).

While scholars are still asking themselves the cause for this phenomenon (see Syverson, 2011, p. 328) we could think, strongly synthesizing, that in the real world the tendency toward a productivity differentiation is a consequence of the fact that, generally speaking, new goods and new processes are introduced n the market and that they are more efficient than old ones. This should introduce in an economy a mechanism inducing dispersion of productivities: high productivity in new firms/sectors (and/or sectors), low productivity in old ones.
This tendency to differentiation can be partly offset by the fact that technological advancements tend to spread also to firms/sectors initially not touched by it, through several channels that we can summarize in the word "imitation".

Second, and perhaps more important, an efficient process of firm selection should eliminate less productive units, so reducing the more or less drastic differences across firms.

As a consequence, the presence and, above all, the persistence of productivity differentiation across firms is seen as a sign of misallocation of resources across firms.

Summarizing, the outcome depends on the balancing of forces going in two different direction: those that determine differentiation and those leading to a reduction of it:

A possible relevant point, here, is the timing of the balancing of the forces described above. If differentiation due to technological innovation, on the one hand, and selection and imitation, on the other, were simultaneous, in principle no differentiation should be evidenced; if, instead, there is a lag between the opposing factors, and if technological push was continuous, as it is, we may expect a sort of “equilibrium” level of productivity differentiation at a given degree. While it would be possible to start from the idea of a simple sequential process of the interplaying of differentiation/ homogenization: first differentiation, then imitation/selection (because, logically, imitation and selection have their reason in the presence of an ex-ante diversity), nevertheless, it is probable that both forces are at work simultaneously somewhere in the economy, especially in complex contexts as in modern times.

Evolution of firm differentiation and linkages with the process of development

A not too much investigated perspective is if firm (productivity) differentiation evolves in time, or, at least, if countries at different level of development have different features in this aspect: since long time series of micro data are not easily available, there is not a long collection of results on this subject (Faggio and al., 2007; Ito and Chevalier, 2008 and 2010; Kalantsis, Kambayashi, and Chevalier, 2012; indirect evidence also in Del Gatto et al., 2008).

In particular, the aims of this paper is the possible evolution of productivity differentiation along the development process: we want to understand if this kind of processes, i.e. the intensity of product differentiation, has to do also with the process of development.

Starting with an anecdotal example, consider the Mexican dualism: as the Economist reports (2015) "economic productivity in Nuevo León, a heavily industrialized state close to the American border, is at South Korean levels. In the south of Mexico it is close to that of Honduras".

In order to generally introduce the question, we start from an idea presented in a study appeared in end of the seventies on six lagged European countries: Fuà (1978, 1980) showed a limited but meaningful empirical evidence that in lagged European economies there were larger productivity and wage gaps among macro-sectors and among manufacturing firms of different size; he then suggested a mechanism of "endogenous" differentiation of productivity in "later developing countries", i.e. countries whose take-off happened (several decades) after the leader countries, linked to the catching-up process.
More recently, in this direction, interesting insights derive from a paper of Ito et al. (2009), where evidence about three countries, based on micro-data, is presented. In their paper they find that while, as expected, the *level* of TFP is higher in Japan than in South Korea and China, TFP *dispersion* across firms (also within industries) is lower in Japan than in the other two countries. This result goes in the direction of confirming the idea of Fuà.

It can be added that in Ito et al. (cit.) convergence in TFP between Korean firms is higher than in Japan (not sufficient data for China), but this is a logic consequence of the higher productivity dispersion, and this can be considered a mechanism of the overall convergence of the country toward high productivity (and living) standards.

In other recent papers, it is recognized that productivity differential can be higher in less developed countries. As an example Syverson (2011), comparing his results with those of Hsieh and Klenow (2009), highlights that the already large productivity differences among USA firms are much lower than those characterizing China and India.

Again, in a study on Indonesia, Van Dijk and Szirmai (2011) conclude that "catch-up of the Indonesian paper industry relative to the global frontier has been a highly localized process in which only a few establishments have achieved near best-practice performance. Most of the other plants stayed in business while operating far from the technological frontier."
Finally, we can summarize this point through the Rodrik words: “Large gaps in labor productivity between the traditional and modern parts of the economy are a fundamental reality of developing

societies" and "whether between plants or across sectors, these gaps tend to be much larger in developing countries than in advanced economies" (2012b, p.1).

Why should this happen?

We may guess that the general forces that we discussed previously, i.e. forces stimulating and reducing firm differences, interact in different ways in countries at different level of development, or, at least, they act with different strength and intensity.

In particular, forces enhancing firm differences (in term of productivity) act stronger in a catching-up countries, and this include also factor intensities; second, mechanisms reducing firm differences, in particular the selection process, could be weaker in developing countries.

The first difference has to do with the technological, unbalancing side of the question; as anticipated a few lines above, in a developing country this has to do necessarily with the process of "catching-up": because the world technological frontier is far from the average level of the country, this constitute a potential for very large gain in productivity that can be realistically exploited, in the short and medium term, only by a limited share of firms. So we can imagine that this process fosters the productivity differences between already modernized and still traditional firms, both across and within sectors. This should be specific of the developing countries of today, since the nowadays developed countries had, when still undeveloped, no or only limited catching-up possibilities, since their position near the frontier.

Second, it is possible to imagine that the selection process is much weaker in developing countries, where the "vast majority of firms are simply stagnant in that they neither exit nor expand" (Akcigit, Alp, Peters, 2014). While several forces can be potentially responsible for this misallocation of resources (Hiseh and Kleanow, 2011; Akcigit, Alp, Peters, cit.), it is probably that the selection process mainly operates in "modern" sectors, while can be more sluggish or even non-existent in other parts of the economy[2]; this feature can also have to do also with the large presence of informality in the economy: as discussed in La Porta and Shleifer (2014), in developing countries a large informal, not modern sector exists, moreover characterized by a very low level of productivity; what is important, this "sector" (agriculture, traditional services, handicraft) appears largely disconnected from the formal economy.

[2] As an example, Rodrik, 2012a, finds a robust evidence of within-sector international catching-up in manufactures, not reflected in a (much weaker) evidence of economy-wide catching-up process

Even if along the process of modern economic growth the informal sector finally shrinks, nevertheless it is a "hard" block whose disappearance, better reduction, takes long time. We can guess that the disconnection from the formal economy also means that profit maximization is not a relevant target in the informal sector: for its owner (ad for its employees too) an informal firm is not to became rich, but to survive, or, rather, to ensure a livelihood to the family.
As a consequence, the selection process can be much weaker in an economy with this presence, since it operates almost exclusively in the formal sector, while it impacts in the informal part of the economy reduces only very gradually in time.

In practice, and in short, while the above described forces are potentially at work in all countries, we are suggesting that it is not probable that developing countries will follow, in this context, the same "path" of already developed countries. Possibly, "stages" (broadly speaking) of productivity differentiation emerge.

The sectoral perspective

All the previous considerations are related to differences between firms (or even plants). Nevertheless, as a preliminary step, I will explore the sectoral perspective: is it possible to conceive that the process above described of the evolution of productivity differentials is also present at the sectoral level?

In a recent study on the Italian case, some authors (Aiello et al., 2015) investigated the source of TFP differentiation, distinguishing between firm, sector, and location levels; they find that the sectoral dimension is a relevant determinant of productivity differentiation of firms.

If we limit our attention to the macro-sectors, some indication on productivity dispersion in countries at different level of development comes from several papers already cited. In general, developing countries, when compared to advanced countries, have different gap levels in different sectors (e.g.: see Restuccia, Jang, Zhu, 2008 for higher productivity dispersion in agriculture).

Moreover, and from another perspective, several studies had highlighted a process of sectoral product diversification along the development path, both in trade and in employment/value added (Imbs and Wacziarg, 2003; Cadot et al., 2011; De Benedictis et al., 2009; Parteka and Tamberi, 2013; Mau, 2016). According to those papers, the process of development is generally matched to a process of diversification of the economy, in the form of an enlarged number of products/sectors present (produced, exported) in the economy itself: a curve of product and/or trade diversification has been unveiled. This process can be thought as the progressive spread of efficient systems of production to new sectors of the economy.
Analogously, can we ask ourselves if there is a curve of productivity differentials linked to the

process of economic development of a country. In other words: are inter-sectoral productivity differentials linked to the level of development?

Moreover, let's consider the impact of trade (or international economic integration in general). Here we should consider at least two points: first, an exposure to internationalization leads to the exploitation of specific comparative advantages: i.e., the process of specialization could foster the efficiency of some sectors, perhaps increasing the heterogeneity of different parts of the economy (sectors and firms). Second, we know that the process of development benefits of the so called catching-up: higher is the distance of firms from the frontier, higher is the possibility of importing (in broad sense) new technologies, higher is the rate of growth of the economy. If this process involved simultaneously and with the same intensity all sectors, this should have no or very limited impact on the productivity and efficiency differentials. But, if the catching-up occurs exactly through export (and product) diversification and through technological improvements, we should expect that the unbalancing effects can be stronger.

We can conclude that the sector perspective is worth to be analyzed, and a meso approach seems potentially useful and fruitful.

Data and methodologies

Data on sector labor productivity are derived from UNIDO INDSTAT 2 (2 digit) and INDSTAT 4 (3 and 4 digit), where both value added and employment are available. UNIDO is the only source of industrial data covering many countries and many sectors, but they are far from perfect. One problem derives from the fact that the coverage is incomplete, at least in two different senses: first in earlier years there are many missing data; second, data come from national industrial surveys, whose coverage differs across countries; in some case very small firms are not included, especially for several developing countries. These problems are especially severe for INDSTAT4. For this reason we concentrate on INDSTAT 2, and we use INDSTAT 4 only for robustness purposes.

In any case, this source of data is used currently in many relevant papers.

In order to analyze the diversification-development linkage, the explanatory variable is the level of development: for this purpose I have used per capita income, PPP adjusted (that will be call *YPC*) from PWT 8.1.

Other data sources, for control variables, are the following, all of them downloaded from WDI-WB (World Development Indicators of the World Bank):

- a couple of variables measuring two different aspects of openness, relevant because of the presence of processes of international catching-up: the share of trade on GDP (i.e. export plus

import on GDP), and the incidence of inflows of foreign direct investments on the economy (FDI inflows on GDP), respectively named *TRADE* and *FDI*.

- In order to check for the possible influence of the size, we also have added total population (*POP*, again from WB-WDI).

- since there is evidence of some outliers (see below), mainly identifiable in oil producer countries, I also added a variable measuring the RENTS deriving from oil and natural gas
-several dummies are then used in the estimation process (mainly geographical).

In principle also data on institutions and on the incidence of the informal sector should be used in the analysis: the serious lack of them for past years has prevented from their utilization.

(here descriptive statistics for all variables)

As for the UNIDO data, they present many missing: I needed to treat the dataset before running regressions.

First, they potentially cover the 1962-2010 period. In reality, data before 1980 are much more sparse and for this reason I concentrate on the time span 1980-2010, even if I will present some analysis also for a more limited period, from 1990, where more countries are included.

Second, while 23 sectors are available in principle at two digits level, actually there are country/year pairs for which there are missing data for some or many sectors.

A look at the distribution of data shows that not missing sector data, for country/year pairs, are concentrated at the two tails; in particular, there are country/year pairs for which no data, for any sector, are present (as an example, we have no data, for any sector, for Argentina in 1980), and a peak is present in the distribution for country/year pairs with at least 18 sectors (out of the 23 potentially available). After a proper aggregation, we can see that data are distributed as follows

table 1

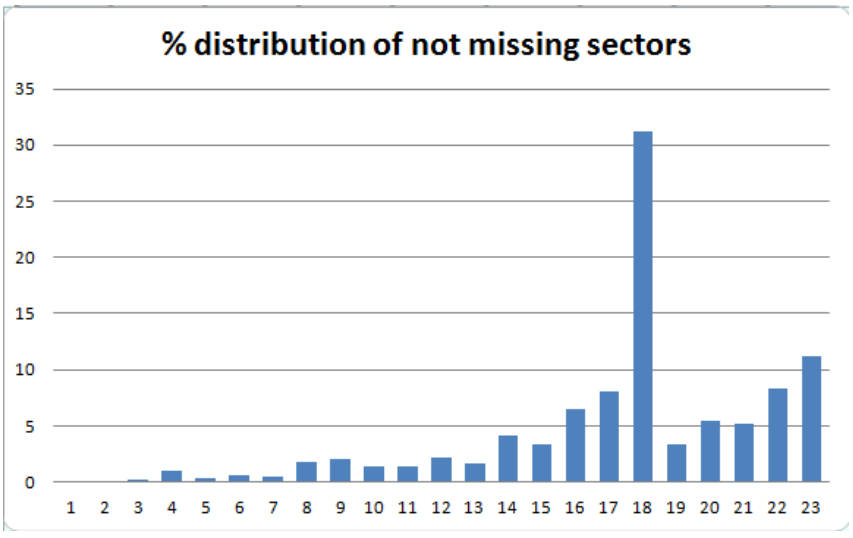
missing sectoral data

	% of year/country pairs
zero not missing sectors	38.5%
1-17 not missing sectors	21.7%
18-23 not missing sectors	39,8%

In order to maximize the available information, but taking into account that we need a consistent number of not missing sectors in order to compute an index of dispersion, we decided to keep only those countries/years pairs for which data for at least 18 sectors were present, i.e. around 40% of the original data. If we do not consider country/year pairs with zero data, clearly completely unuseful, our choice catches about 65% of the pairs. The distribution of year/country pairs, omitting those with no data at all (i.e. 0 not missings), is represented in the following figure 1

fig. 1

frequencies of not missing sectors, (0 not missing pairs excluded)



As a measure of inter-sectoral productivity dispersion we opted for the coefficient of variation (*CV_labprod*). While, differently from the otherwise parallel analysis of export productivity, concentration indexes have no sense here, the CV seems more suitable than a simple standard

deviation because this latter is sensible to absolute differences and countries have very different average level of productivities both in space (when different countries are compared) and in time (also considering the long period, 30 years, covered the analysis). The CV is instead sensible only to change in relative differences.

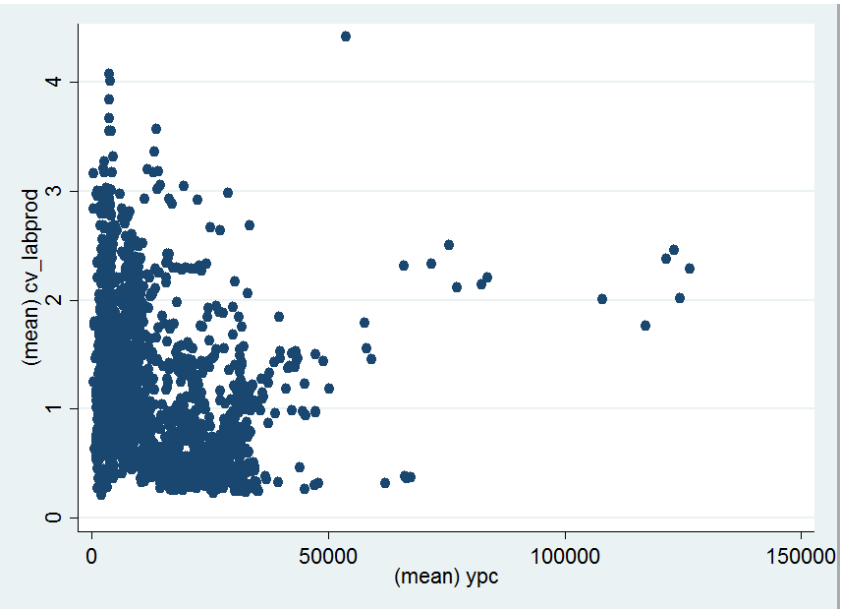
In the end our panel is composed of 89 countries; it is not a balanced panel, in the sense that there are not data for all years for several countries; in sum we have 1486 observations.

Data are highly dispersed, as evidenced is the following figure

fig 2.

CV of sector labor productivity and per capita income

1980- 2010



Nevertheless, dispersion seems high at low level of per apita income, lower at high level, with few points that seem an isolated case: in the figure some data, dots relative to ypc>50000, visually appear as outliers. Those dots, identifying different country/years pairs, are detailed in table 2.

table 2 - number of observations for ypc>50000

country	Number of observations
Kwait	6
Qatar	9
Norway	5
Singapore	1
sum	21

All countries are small, all but one oil producers[3]. As anticipated, I include a specific variable (RENTS) for taking into account a possible since in the estimations we will control for country specific effects (dummies), and this should not be a major problem.

Our basic model will be $cv\_labprod = \alpha + f(ypc) + \varepsilon$; it will be implemented in at least two ways:

1 - introducing some control variables, i.e. $cv\_labprod = \alpha + f(ypc) + \beta X + \varepsilon$, where X is a set o variables different from *ypc*

2 - introducing space and time controls, i.e. $cv\_labprod = \alpha + f(ypc) + \beta X + \gamma D_i + \delta D_t + \varepsilon$

As probably could be guessed by fig. 1, the correlation of *labprod_CV* with *ypc* is negative (and equal to 0.199).
In any case, and just to have a benchmark, we run a linear regression, getting a coefficient of *ypc* negative and significant; nevertheless, this is too far a rough indication, and we need to develop a more sophisticated analysis.

Nevertheless a negative linear slope is a non sense because of at least two reasons: first, because the dependent variable cannot assume negative values, as instead implicit in a linear negative slope; second, because it is probable that a positive, even if limited, amount of "inequality" persists also at high level of income.
For this reason I tested several nonlinear forms; alternatively: the reciprocal (i.e. $cv=f(ypc^{-1})$,with ypc^{-1}called *frac_ypc*; the quadratic form where *cv=f (ypc, ypc_sq2*), and a lin-log form, *cv=f(ln(ypc))*. If the hypothesis of the paper were to pass the test, we have to expect a positive coefficient for ypc^{-1}; a negative coefficient for the linear term, and a positive one for the quadratic

[3] This seems in parallel with the findings of Parteka and Tamberi, 2013

term in the case of the second order polynomial; and, finally, a negative coefficient in the case of the lin-log estimation.

Results

As somehow anticipated, all forms will be tested in the following along this lines:
- pooled OLS regressions in which *ypc* is the only explanatory variable
- pooled OLS with the introduction of control variables (relative to openness and size)
- panel FE regressions in which the all the previous steps are repeated with the introduction of country and time dummies. In particular the presence of country dummies has the consequence that we can consider each country/year pairs as the representation of an ideal country along its process of development.

Finally, all estimations are robust to heteroskedasticity.

Results of the first two steps are showed in the two panels of table 2.

table 2 - panel 1

RODUCTIVITY DIFFERENTIATION AND INCOME

Pooled OLS 1980-2010

dep. variable: labprod_cv

(robust standard errors, t stat in parenthesis)

	ln_cv	(mean) cv_labprod	(mean) cv_labprod
ln_ypc	-0.228		
	(13.06)***		
frac_ypc		0.741	
		(7.53)***	
ypc			-0.038
			(15.61)***
ypc_sq			0.000
			(12.41)***
Constant	0.483	1.040	1.567
	(11.64)***	(45.51)***	(45.03)***
F	170.67	56.63	121.77
R2_A	0.12	0.05	0.14
N	1,486	1,486	1,486

* p<0.1; ** p<0.05; *** p<0.01

table 2 - panel 2

	cv_labprod	cv_labprod	cv_labprod
trade	0.001	0.000	0.001
	(2.48)**	(1.67)*	(2.43)**
fdi	0.000	-0.001	0.000
	(0.09)	(0.67)	(0.05)
pop	-0.000	-0.000	-0.000
	(1.94)*	(0.83)	(1.75)*
rents	0.016	0.015	0.013
	(7.11)***	(7.22)***	(4.71)***
dummygrowth	-0.074	-0.108	-0.042
	(1.36)	(1.94)*	(0.77)
LAC	0.504	0.592	0.483
	(8.85)***	(10.40)***	(8.32)***
EA&P	0.378	0.425	0.360
	(6.73)***	(7.31)***	(6.46)***
ln_ypc	-0.181		
	(8.41)***		
frac_ypc		0.549	
		(5.26)***	
ypc			-0.027
			(10.22)***
ypc_sq			0.000
			(8.77)***
Constant	1.399	0.904	1.282
	(19.35)***	(14.64)***	(20.48)***
F	49.49	44.02	53.73
R2_A	0.24	0.22	0.25
N	1,333	1,333	1,333

* p<0.1; ** p<0.05; *** p<0.01

The level of development (*ypc*) is always significant, both in the estimation with and without the control variables (discussed below) and the signs of the coefficient are as expected, suggesting a negative relationship between the two variables of interest, productivity dispersion and the level of development: in short, it appears that the sector productivity dispersion decreases with the level of development.

I do not attach much importance on the non-monotonicity suggested by the quadratic form, in the sense that it is a result of the functional form; in any case, further and relevant indications will be provided on this point, in the comments to table 3.

Many control variables do not come out as robustly significant determinants of the productivity dispersion, a part from *rents* and, partly, *trade*. I considered the possibility that the phenomenon in analysis was relevant in particular for countries with a sensible rate of growth of the economy, for this reason here is a d*ummygrowth*, a dummy whose value is 1 if the average rate of growth of the period was at least of 1.5% (zero otherwise), but it is not robustly significant. I also used many

regional dummies: in table 2 (panel 2) I included the only significant ones: EA&P (East Asia and Pacific) and LAC (Latin America and Caribbean), according to the regional aggregation of the WDI-WB.

I now pass to FE estimation. Results can be viewed in table 3, where the same variables and functional forms of table 2 are present, but adding both time and country dummies.

table 3 - PRODUCTIVITY DIFFERENTIATION AND INCOME

FE estimations 1980-2010

dep. variable: labprod_cv

(time dummies included; robust standard errors; t stat in parenthesis)

panel 1

	(mean) cv_labprod	ln_cv	(mean) cv_labprod
frac_ypc	-0.696		
	(1.61)		
ln_ypc		0.031	
		(0.14)	
ypc			-0.037
			(2.12)**
ypc_sq			0.000
			(2.31)**
F	4.69	3.62	3.73
R2_A	0.04	0.02	0.06
N	1,486	1,486	1,486

* p<0.1; ** p<0.05; *** p<0.01

panel 2

	cv_labprod	cv_labprod	cv_labprod
trade	0.002	0.002	0.003
	(0.99)	(0.88)	(1.24)
fdi	0.000	-0.000	0.001
	(0.19)	(0.02)	(0.79)
pop	0.002	0.002	0.001
	(3.71)***	(1.86)*	(1.65)
rents	0.016	0.013	0.017
	(1.31)	(1.33)	(1.61)
ln_ypc	-0.250		
	(1.03)		
frac_ypc		-0.193	
		(0.32)	
ypc			-0.042
			(2.25)**
ypc_sq			0.000
			(2.47)**
F	6.20	6.56	8.04
R2_A	0.06	0.06	0.08
N	1,333	1,333	1,333

* p<0.1; ** p<0.05; *** p<0.01

Results are not strong: only the quadratic form maintain its significance, albeit clearly reduced.
As said above, we do not attach interpretative relevance to the change of slope implicit in the quadratic form. Moreover, taking as an example the coefficients values of the last column of table 3 (panel 2), we can note that the value of *ypc* for which we have the minimum of the dependent variable is very high: in practice, only 8 observations, 0,5% of total, are beyond that value, 2 for Kuwait, 6 for Qatar.
In the end, some signs that the negative relationship between productivity differentiation and per capita income remain, even if weak.

I can also consider tjhtat, specific country dummies capture unknown variables and are neither a description nor an explanation; it is possible to think that an effort can be made in order to understand what is behind them.

Robustness

As robustenss checks I have considered the following possibilities:

1) given the possibility that the distribution of productivity in poorer countries was in some degree more "dualistic" than in the richer ones, and not simply more dispersed I used kurtosis of

productivity as dependent variable, repeating the previous steps of the analysis. Results remain practically unchanged, in the sense that the new dependent variable show the same kind of relationship with *ypc* (non linear) in the pooled OLS, with and without controls.

2) Then, I reduced the number of non missing sectors considered; in practice, I decided to keep in the analysis those countries/years pairs for which data for at least 16 sectors were present, instead of 18 as in the previous analysis. The choice is based on data represented in figure 1: pairs with 16 and 17 non missing sectors are still a sensible share of the total. In this way I can increase the number of observation of 18%, passing from 1486 to 1759. Again, results remain completely unchanged.

2) I also changed the the time span: I selected the 1990-2010 period instead than 1980-2010), and through this procedure I can include an higher number of countries. Again I got similar results

4) Finally, I passed to 3 and 4 digit disaggregation. In the first case the available number of sectors passes from 24 to 60, and in the second to 127; the time availability is 1985-2010 at 3 digit level, and 1990-2010 at 4.

A problem with these levels of disaggregation is that the number of missing greatly increase .

At 3 digit, I have about 27% of country-year pair with no data; if I consider only pairs with at least one sector, in order to have at least 50% of the distribution I should consider pairs with 45 sectors or more, for 75% I need to include pairs with at least 37 non missing data. Following this last configuration, have a matrix with 770 observations, practically on half of the 2 digit case: Results of the estimations remain again unchanged qualitatively, with *ypc* negatively and non linearly significantly associated with *CV*, in all the pooled regressions; significance disappear with the introduction of country dummies.

At 4 digit, I found again 26% of cases with non data; eliminating them, I need to consider pairs with 76 or more present sector in order to have 50% of the remaining data, and 44 to reach 75% of the distribution. Since 44 sector is too poor, compared to the potential of 127 sector, I decided to limit to at least 76 sectors. This means that I work with 583 observations, a roughly more than one third than the 2 digit case. Also in this case results remain qualitatively the same It can be remarked that the overall fit of the curve is improved in the pooled regressions, with higher levels of adjR2 and F. Nevertheless, in this case I found no significance at all when country dummies are introduced.

Conclusions

Conclusions from the previous analysis can be proposed in few and simple lines: in short, it seems that there are some signs that productivity dispersion is higher in poor countries, even if these signs are not that strong

If we accept this result, it can be more interesting, and more fruitful for research and policy purposes, to read the results of the present analysis jointly with those derived from the product/export diversification quoted in the first sections of the paper.

We can outline a picture of this kind: poor countries are usually relatively homogeneous, i.e. scarcely diversified, from the point of view of the types of goods they produce (and/or export); on the contrary, they are highly diversified in terms of the productivity levels of the same products.

The mirror image is obviously that rich countries have a very diversified economy, i.e. they produce a lot of different products, and, in the meanwhile, these different products are produced with a relatively similar efficiency (productivity).
If these results will be confirmed in further analysis, they should be taken into account both in the design of industrial policies and in the potential impact in terms of income distribution.

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