Economics and Politics in the Israeli Palestinian Conflict

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Palestinian Economic Development: The Destructive Effects of Occupation

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Executive Summary

This paper tries to estimate the cost of occupation for Palestine in one dimension only, its effect on Palestinian economic development, or growth of GDP. We begin with the observation that Palestinian GDP per capita did not grow by much since 1993, and income did not grow at all, since the mild growth of GDP was accompanied by a significant loss of labor income from Israel. We then turn to measure the growth of output per worker, which is the main measure of productivity and find that this variable also declined since 1993, in general in Palestine and especially in Gaza. In order to analyze this decline we apply the standard tools of studying economic growth. We calculate the changes in capital over this period and from that we can calculate Total Factor Productivity, TFP, over time. We then can also examine how capital accumulation adjusted to changes in TFP. We come up with two main findings. The first is that in the initial period of the PA, in 1993-2002, TFP declined significantly. In Gaza it further declined in 2006-2008. We also find that investment is quite limited in Palestine, so it does not experience capital deepening at all. Capital is only adjusted to match changes in labor. We then turn to explain these two developments. We raise the possibility that all the decline in TFP was due to the increase in barriers to mobility in Palestine, like road blocks, checkpoints, the fence, closures, closing of Gaza, and similar measures. As for limitations on investment we show that these can be caused both by administrative measure enacted by the occupation and also by the effect of security risk in Palestine.

1. Introduction

The Oslo Accords were signed in September 1993. The following year, the Palestinian Authority was formed and the Autonomy for Palestinians began. In 1995 it expanded from the Gaza Strip and the area of Jericho to include parts of the West Bank as well. This process was accompanied by great hopes for rapid economic growth. These hopes have not materialized yet, after more than twenty years. The main measure of economic growth, namely output per worker, revels that since 1994 the Palestinian economy did not take off, and it actually grew very little during the last 20 years. Until 2009 output per worker, or as it is also defined labor productivity, did not rise at all. During the two years 2010-2011 the output increased, but mainly in the public sector. Furthermore, this public sector growth has faced severe dangers recently, due to reductions in transfers from the donor countries. Our main goal in this paper is to understand the causes that stood behind this stagnation, namely to try to identify the main reasons why the Palestinian economy is mired in such a development trap.

We approach this question by doing a macroeconomic analysis first and then a microeconomic analysis. Our macro analysis uses the standard aggregate production function approach, and tries to identify the changes in output as related to the changes in the three factors that contribute to economic growth: labor, capital, and productivity. By productivity we mean 'Total Factor Productivity,' denoted also TFP. We calculate the dynamics of productivity by using the standard method of 'growth accounting,' namely subtracting the contributions of labor and capital from output and attributing the residual to total factor productivity. Once we calculate the path of productivity over time we can calculate the equilibrium level of output given this productivity under various assumptions. Comparing these potential paths with the actual historical path enables us to learn much about what happened in the last 20 years.

Our main conclusion is that capital did not fully catch up with the rise of productivity, but only caught up with the rise of labor. Namely, the Palestinian economy was severely constrained in its ability to invest, so that there was no capital deepening, nor a major element in Economic growth. Hence, even when productivity increased it did not materialize its full potential for Economic Growth. In the second part of our paper, where we run the microeconomic analysis, we show that many of the constraints to investment have been administrative and were the result of the occupation regime in the Palestinian territory. The limitations on investment can be of many types, like refuse to import machines or materials on account of 'dual use' claims, limitations on access to land, limitations on road and infrastructure constructions and constraints on entry of international investors and experts. We also show that many investments are adversely affected by high risk, which is also a result of the occupation and the violence it creates. All these deter the investment significantly.

A second result of our macroeconomic analysis is that for half of the period, during the years 1994-2004, productivity declined. Such a decline overlaps with the period of increasing restrictions to mobility, between the West Bank and Gaza and within these areas as well. In the microeconomic part of the paper we analyze these barriers to mobility in details and calculate by how much they increase the costs of mobility and as a result by how much they have reduced total factor productivity. We realize that their effect on productivity is very large, and it is capable of explaining most of the decline in productivity that we have found.

Hence, our conclusion from the combined macroeconomic and microeconomic analysis of the lack of economic growth in Palestine shows that there has been insufficient investment in physical capital and also a long period of reduced productivity due to the impediments to mobility that began in the 1990s. We also calculate by how much the Palestinian economy could have grown without these two impediments and find that the lost output in these two decades could be as high as 80 percent of GDP per worker or per capita. Namely, output today could have been almost twice as high and we claim that this is a very conservative estimate.[1]

Therefore, we conclude that, the low average rates of growth in the Palestinian economy are -to a large extent- the result of the occupation. This of course does not mean that there is no room for mistakes or failures on the Palestinian side, but usually long-run growth is not strongly affected by such failures. It is mainly driven by the basic conditions in which the economy performs. It is therefore hard to ignore the fact that Israel controls -to a large extent- most of the conditions in which the Palestinian economy functions. It definitely controls the ability to invest and it also controls the ability to move goods across the Palestinian areas.

The paper is constructed as follows. Section 2 shows that there was no economic growth in Palestine since 1993. Section 3 analyzes this finding by the using the aggregate production function and points at impediments to investment and to mobility as the main suspects for low growth. Section 4 describes the barriers to mobility and Section 5 shows how such barriers reduce productivity. Section 6 describes the various obstacles to investment. Section 7 calculates by how much the Palestinian economy could have grown without these two impediments. Section 8 concludes and the Appendix contains the required economic theories and sector details on barriers to mobility and investment.

2. The Growth of the Palestinian Economy

We begin by describing the basic facts of economic growth in Palestine since 1994. Our data on output is up to the year 2013, so we present in this Section the growth in 1994-2013, over 19 years. Our unit of measurement is GDP per capita in 2004 US dollars, namely in real terms. Table 1 presents the average rates of growth of output in the Palestinian economy since 1994 for the aggregate economy, and separately for its two main regions, the West Bank and the Gaza Strip. The average rate of growth is calculated for specific periods, reflecting mainly the political developments over time. The years 1994-1996 are the first years of the Palestinian Authority, 1997-1999 are the years of the decline of the Oslo Process, 2000-2004 are the years of the Second Intifada, 2005-2007 are the years of the complete split between the two regions, and the years 2008-2013 reflect the gradual establishment of a new political equilibrium of a split rule. These are also the years of the global financial crisis that had some effects on Palestine, mainly by reducing the donations from the donor countries.

Table 1: Average Real Rates of Growth of GDP in 1994-2013 (in %)[2]

Years	1994-1996	1996-1999	1999-2004	2004-2007	2007-2013	1994-2013
Palestine	4.2	12.4	-1.2	4.5	7.3	5.1
West Bank	5.2	14.3	-2.2	7.6	7.6	5.8
Gaza Strip	2.2	8.7	1.1	-1.3	6.8	3.8

1. Note that investment is important not only to materialize gains from productivity, but also to increase productivity itself. Many technologies are embedded in capital goods, mainly machines and these technologies are adopted only by purchasing these machines. This negative effect on productivity is not estimated in this paper.
2. The Data are from PCBS. The growth rate in 1994-1996 is actually an average of two years, 1995 and 1996.

Table 1 is revealing in many ways. It shows that the rate of growth fluctuates significantly over time and also across regions. But, this paper focuses on the long-run performance and not on the volatility of economic growth. Taking into consideration that the long-run is disappointing, the average Palestinian rate of growth over the whole period for Palestine as a whole is 5.1%. It is not a high rate of growth for Palestine for three reasons. First, it has a high rate of population growth, so income increased by much less. Second, the growth of output in the last sub-period comes mainly from the public sector, namely from donor countries' money. Third, after many years of direct occupation and slow growth, it was expected that the Palestinian Authority will start a fast process of catching up. This did not happen. Table 1 also shows that the rate of growth in the West Bank was higher than in the Gaza Strip. It means that per capita, the Gaza Strip did much more poorly, since its rate of population growth is higher. We show it below.

Table 2: Average Rates of Growth of Real GDP per Capita in 1997-2013 (%)

Years	1997-1999	1999-2004	2004-2007	2007-2013	1997-2013
Palestine	7.7	-4.1	1.3	4.2	1.5
West Bank	10.3	-4.8	4.6	4.7	2.4
Gaza Strip	2.7	-2.1	-4.6	3.3	0.0

We next turn to describe the rates of growth of GDP per capita over the years 1997-2013. Table 2 presents averages of these rates of growth over sub-periods and over the whole period in a similar way to Table 1. The choice of sub-periods is the same as in Table 1, except that we omit the first one for lack of data. The story revealed by Table 2 is much grimmer than the one told by Table 1. The average rate of growth in Gaza is negative, namely in these 16 years Gaza has stagnated economically. The average rate of growth at the West Bank is higher, but does not look like a dynamic catching up economy at all. The aggregate rate of growth over the period is only 1.5%, which is low and if we omit the year 2011 it is close to 0.

Figure 1: GDP per Capita in Palestine 1997-2011 (natural logarithm times 100)
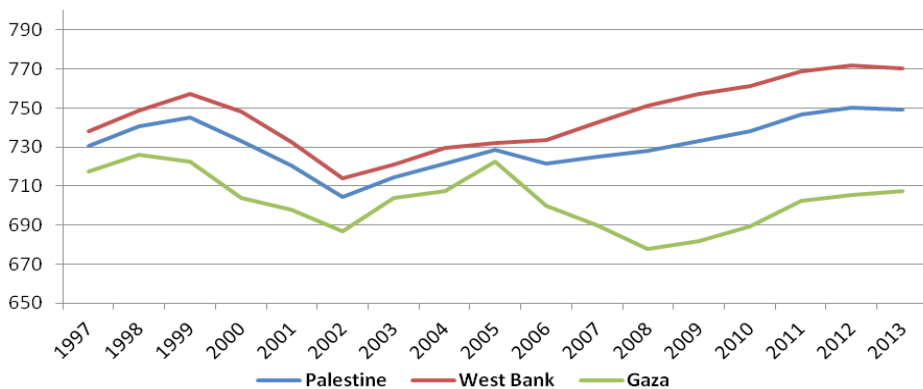
In order to see the growth performance more graphically we present the data from Table 2 in Figure 1. This figure depicts GDP per capita in Palestine and in the two regions from 1997 to 2013. In order to gain more information on the rates of growth we calculate for each year

the natural logarithm of GDP per capita and multiply it by 100. This presentation is very useful, since the figures on the vertical axis can be easily translated to percentage changes of average rates of growth. Thus, if we look at the curve that describes Palestine, it goes from 750 in 1997 to around 762 in 2011, which means an average rise of 12/14=0.9 percent. What Figure 1 reveals is that if we omit the years 2010-2013, then between 1997 and 2009, over 12 years, GDP per capita in Palestine did not grow at all. This finding requires further research, to which we turn below.

Before we explore the factors that determine GDP, we compare the growth of the Palestinian economy to the neighboring Arab countries, which are, to a large extent, similar countries, in geography and culture. We compare the Palestinian growth rates of GDP per capita with those of Egypt, Jordan, Lebanon, Syria, and Tunisia. These are close Arab countries, which are not oil producers, hence similar to Palestine. We remove from the comparison the years 2011-2013, in order to remove the effect of the 'Arab Spring' from the comparison. What Table 3 clearly shows is that economic growth of Palestine was significantly lower than in the neighboring Arab countries. It was slower even compared to Syria, who suffered from a severe economic crisis during that period. This leads us to the conclusion that the disappointing economic performance does not reflect some general Arab phenomenon and it is specific to the Palestinian economy and its specific conditions. We turn to this analysis in the next Section.

Table 3: Average Growth Rates of GDP per Capita in Some Arab Countries, 1997-2010 (%)

Years	1997-1999	1999-2004	2004-2007	2007-2010	1997-2010
Palestine	7.7	-4.1	1.3	4.2	1.0
Egypt	3.38	1.61	5.05	3.12	3.16
Jordan	0.72	3.32	5.57	1.61	3.17
Lebanon	0.51	0.03	2.03	5.64	1.59
Syria	-1.39	2.60	1.51	1.65	1.39
Tunisia	3.99	3.53	4.71	1.93	3.49

# 3. Analysis of Palestinian Economic Growth

Analysis of economic growth, which is essentially a long-run economic phenomenon, focuses on the supply side of the economy and follows the basic method of an aggregate production function. According to this method, output (GDP), depends on three main elements. One is labor input, which can be measured in number of workers, or in hours worked in a year, depending on the available data. The second element is capital, namely all the equipment, buildings and infrastructures used in the process of production. The third is total factor productivity, or TFP, which is a measure of how productive the economy is. Usually, productivity reflects many ingredients, like level of technology in the country, human capital of workers, namely level of education, quality of institutions, and geographical factors, etc. While labor and capital are 'factors of production', productivity is more elusive to define and to analyze.[3] We usually assume that TFP accounts for a variety of factors, like the

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3. Labor is a flow variable, and it is thus measured as number of labor units employed during a year. Capital is a stock variable, namely it is the existing quantity of capital in operation. It is usually measured in the end of the year, December 31. TFP is a ratio variable and is neither a stock nor a flow.

level of human capital, level of technology, quality of institutions, geographical conditions and other factors that affect production. TFP is not observed directly, but is calculated as a residual. Namely, the annual change in TFP is all the change in output that is not a direct result of changes in labor and in capital.[4]

We begin the analysis by plotting GDP per worker in the Palestinian economy. This variable is also called 'labor productivity' and it removes the effect of labor in order to better assess how productive the economy is, but it does not remove the effect of the other factor of production, nor capital, so it is still not a measure of total factor productivity. As Figure 2 shows, output per worker declined significantly in the initial years of the Palestinian Authority, in spite of the high rate of growth at that time. The decline of output per worker is also in contrast to the rise of output per capita in these years, implied by Figure 1. As Figure 2 shows, from 1996 to 1999 output per worker fell by more than five percent annually and since then it remained low, though fluctuating a bit, namely it did not recover from the decline of the 1990s. The difference between the two Figures is easy to explain. During the 1990s Palestinian labor in Israel was gradually reduced, due to mobility regulations and a wave of foreign workers that arrived in Israel. As a result these workers moved to Palestine and increased output and output per capita, though not by much. Output per worker fell, for reasons to be discussed below. Furthermore, income in Palestine decreased, because although domestic output per capita remained about the same, the high income from working in Israel was reduced drastically, thus average income fell.

Figure 2: Output per Worker in 1995-2013 (natural logarithm times 100)
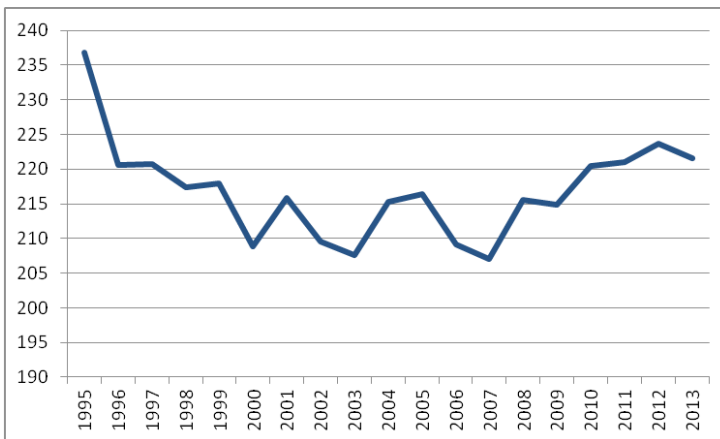
We next turn to calculate Total Factor Productivity. For that we need first to find the amount of capital in each period. We calculate it using the Perpetual Inventory Method. We first assume some initial values of capital. We then add every period the amount of gross investment, namely the gross increase of capital, to last period capital. We then deduct the depreciation of last period capital, using some rate of depreciation, and that sums in current period capital. This method depends on some assumptions. We assume in this calculation that the rate of depreciation is 8%. This is due to the fact that most of the capital in general, and especially in Palestine, is structurs. As for the initial level of capital we assume that it is somewhere between 1 to 1.5

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4. Appendix I describes the production function, the derivation of TFP and other calculations more technically.

times initial output. This fits well the results of calculations of the Palestinian stock of capital before 1994, in Arnon and Gotlieb (1996). We then check whether this ratio remains stable throughout the period, as a robustness check.

After calculating the quantities of capital, we turn to calculate Total Factor Productivity in the Palestinian economy, using the classic method of Solow (1957). This method calculates the rate of growth of productivity as a residual of the rate of growth of output, minus the contributions of the growth of labor and of capital. This calculation requires in addition to data on GDP, labor, and capital also the shares of capital and labor. Since we do not have data on these shares in Palestine, we just assume that these shares are 1/3 for capital and 2/3 for labor, as in most countries around the world. Following this assumption we calculate the Total Factor Productivity over the period 1996-2011.

Productivity affects output through two channels. One is direct, as it increases output, even for the same inputs of labor and capital. The other channel is indirect. An increase in productivity increases the rate of return from capital. As a result it induces investment and the amount of capital increases. This also affects output, which increases when capital is accumulated. Actually we can calculate the two effects of TFP on output if capital is assumed to adjust freely to increased profitability, and if we postulate a specific production function, as explained technically in Appendix I. Figure 3 presents the results of this calculation. The blue line is output per worker. The red line is output per worker if capital could be invested freely in the economy (both are in logarithms multiplied by 100). The two lines were made to coincide artificially in the year 2003. This is possible because we do not calculate the value of productivity, but only by how much it changes over time. Hence, shifting the red curve up or down does not change the dynamic picture at all, but it helps to compare the two curves to one another.

Figure 3: Output per Worker and Implied Output under Free Investment
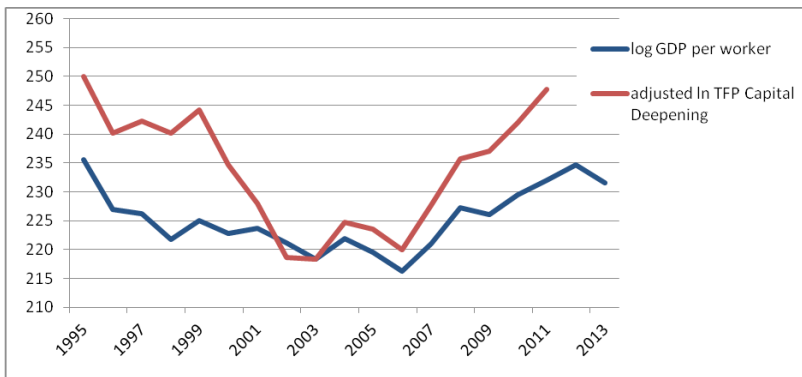

Figure 3 shows clearly that the model of free investment fails to account for the actual changes in the Palestinian economy. The virtual output per worker, which is described by the red line, falls by much more than actual output per worker in some periods and rises by more in other periods. During the years 1996-2003 output per worker fell by 4% annually on average, while the equilibrium output per worker according to this model fell by more than 8% annually, twice as much. In the years 2008-2011 output per worker increased by 4% annually on average, while the model output per worker increased by more than 10% annually. Hence the free investment model fails dramatically.

Figure 4: Output per Worker and Implied Output under Depressed Investment
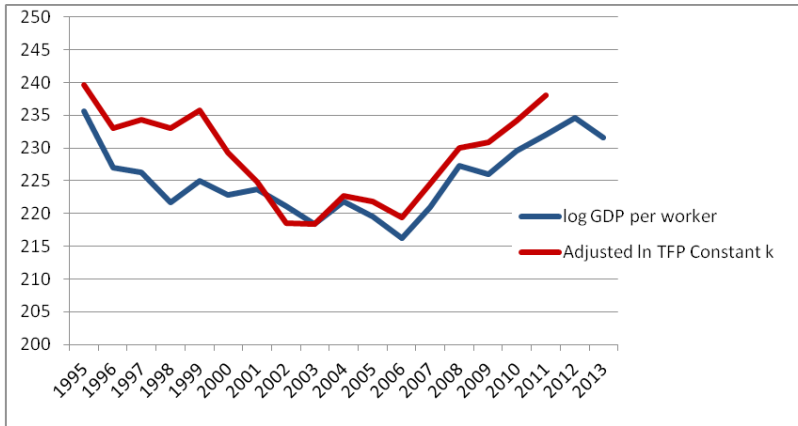
We therefore examine another possibility, namely that capital is not fully adjusted and that investment is indeed constrained. More specifically we assume that the capital-labor ratio is constant over time. That means that firms cannot invest freely and they can only cover physical depreciation and invest the amount required to fit the increase in labor. In other words, the model assumes that there is no capital deepening in the economy, even if productivity changes. In Figure 4 we present the calculation of the virtual equilibrium output per worker under this assumption, the red curve, and compare it with the actual GDP per worker, the blue curve. As Figure 4 shows, the model fits actual output per worker pretty well. Hence we deduce from Figures 3 and 4 that investment in the Palestinian economy has been constrained significantly during these years. This is clearly one of the main explanations to the slow economic growth in the Palestinian economy, since capital deepening is important for economic growth. In the period 2003-2011 this could have more than doubled the Palestinian rate of economic growth, as implied by the two figures.

The conclusions derived from Figures 3 and 4, that investment is highly constrained in Palestine, receive support in a recent study of the World Bank (2014). According to this research the level of capital per worker in the West Bank and Gaza is much lower than in the neighboring Arab countries, and is even lower than in Palestinian East Jerusalem. Another recent research that tends to support this conclusion is Amodio and Di Maio (2015), which is a microeconomic study over firms in Palestine during the Second Intifada. They found out among other things that that the capital labor ratio was quite stable across regions, despite other differences they find. Hence, this study also points at the relative stable relationship between capital and labor, which we interpret as lack of capital deepening.

Figure 4 tells us also an additional important story about Palestinian development. A large part of the grim record of economic growth lies in the period between 1996 and 2003, when productivity declined sharply, as shown by the red curve in the figure. What caused this decline in TFP? There can be two possible explanations. One is the return of the Palestinian workers from the Israeli labor market, if they were less productive than the workers in the Palestinian labor market. But this explanation is dubious for two reasons. First, workers in Israel were usually of high productivity, as these jobs attracted stronger, more flexible and more ambitious workers. Second, even if these workers required some period of adjustment

to the domestic job market, it could not explain a permanent decline of productivity. The second possible explanation to the decline in productivity is related to the gradual rise of movement restrictions in the Palestinian areas. Initially, the restrictions were mainly between the West Bank and Gaza, called 'closures,' but gradually movement within these two regions also became restricted and things deteriorated rapidly during the second Intifada. We show below that these barriers to mobility could explain most of the large decline in productivity.

We performed similar calculations for the West Bank and Gaza separately and the results are quite similar, as presented in Figures 5 and 6, for the West Bank and for Gaza strip respectively. This figures show that the model of no capital deepening fits the data best in the two regions. We therefore conclude that both regions suffered from similar problems, a sharp decline in productivity in the first ten years of Oslo, and limited investment throughout the period.

Figure 5: Output per Worker and Implied Output under Depressed Investment in the West Bank
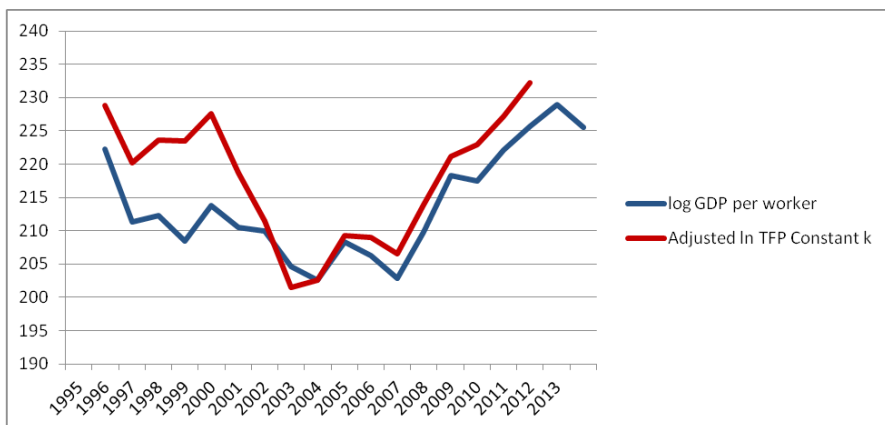
Figure 6: Output per Worker and Implied Output under Depressed Investment in Gaza Strip
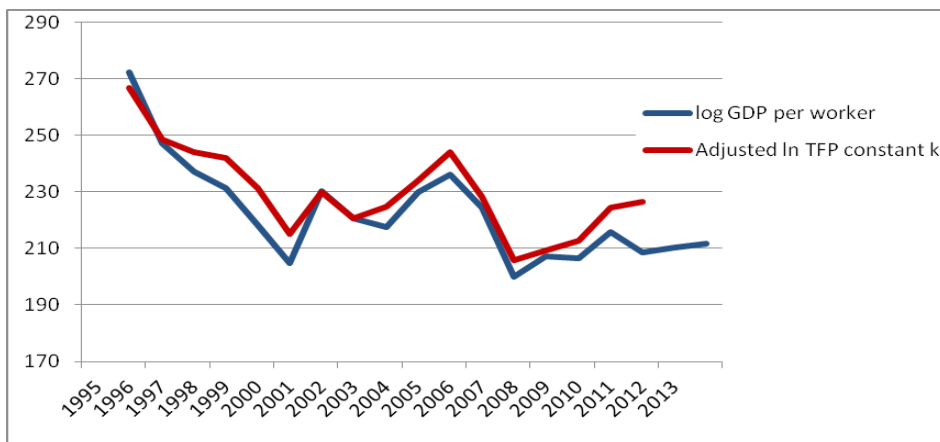
4. Barriers to Mobility under Occupation

Until the end of the 1980s Palestinians enjoyed fairly free mobility both in the occupied territory and in Israel itself. The building of more and more settlements and the first Intifada started to gradually reduce this free mobility. But the first massive restriction was enforced during the first Gulf War in 1991. During that year, Israel imposed a full closure of the occupied territory for the first time. This closure, which was imposed for a relatively long period of time, started a trend that became harsher over time. During the 1990s, closures became more and more common. The excuse has been mainly security reasons, but it has been clear that this policy became easier to implement because of the Russian immigration to Israel. This immigration marked a decreasing to the rate of Palestinian unemployment in the early 1990s,, and the beginning of the inflow of foreign workers to Israel. The main sectors of employment for these foreign workers were construction, agriculture and services, which were also where most Palestinians used to work. Hence, the main developments that helped to facilitate the policy of closures were deep changes in the Israeli labor market.

Clearly, the closures badly affected the Palestinians who worked in Israel, and the mobility in general between the West Bank and Gaza strip in general, and the mobility of goods in particular. As a result, these closures raised the costs of transportation for Palestinian production and reduced potential markets for Palestinian enterprises. It is important to note that the closures hurt not only mobility of goods between the West Bank and Gaza, it affected the mobility of individuals also. This was a gross violation of the Oslo Accords, which states that both areas belong to a unified territory and should be connected. There were many discussions between Israel and the Palestinians on a 'safe passage' between the two regions, but it was not implemented most of the time. The lack of such "safe passage" also had economic effects that include Palestinian labor and goods markets. It is also important to note that the closures hurt Palestinian enterprises also by making their access to ports in Israel, mainly Ashdod, more costly. This had a significant impact on the ability of Palestinians to export and import to other countries and even to Israel.

However, the 1990s witnessed more than the imposed restrictions on mobility between the West Bank and Gaza strip, or between them and Israel, it witnessed the increased pressure on mobility within each area. The Oslo Accords led the Israeli government to be more receptive to the demands of the settlements. Accordingly, it began to dedicate many roads to be used by settlers only, and Palestinians have been driven to use longer streets, which were, as a result, more costly. Things deteriorated more drastically with the outbreak of the Second Intifada in 2000. Checkpoints, road blocks, Bulldozing roads to many villages and other obstacles of transportation had abounded and increased the cost of transportation significantly.

According to International Law Israel is responsible, as an occupying power, for the welfare of the Palestinian population under its control and for ensuring that they are able to exercise their basic human rights. While Israel is allowed, under international law, to restrict the freedom of movement of Palestinians due to legitimate security needs, it can do so only "to the extent strictly required by the exigencies of the situation, in a non-discriminatory manner and taking into account other legal obligations."(OCHA, 2012). Nevertheless, as observed by the World Bank (2008): "While Israeli security concerns are undeniable and must be addressed, it is often difficult to reconcile the use of

movement and access restrictions for security purposes from their use to expand and protect settlement activity and the relatively unhindered movement of settlers and other Israelis in and out of the West Bank."

Two more developments further reduced mobility of Palestinians and thus contributed to the rise of transportation costs. The first one was the building of the separation wall since 2003, which physically closed Israel to the West Bank, and left only a small number of checkpoints for passage between them. The second development relates to Gaza. In 2005, Israel unilaterally withdrew from the Gaza Strip and began to isolate Gaza from the outer world (first to workers traveling to Israel and then the passage to Egypt). This policy became harsher in 2006 when Hamas won the Palestinian elections, and even more after the taking over of Gaza by Hamas. Following these events, the Gaza Strip became completely closed to the outside world and the siege continues until today. The siege clearly affected the economy of Gaza and as shown in Table 2. During the years 2004-2007, the output per capita in Gaza declined by more than 15%. The siege has an effect on the economy of the West Bank as well. It reduces markets significantly for West Bank producers, both markets for inputs and for outputs. This increases the costs of starting a new business, namely it reduces productivity. In the rest of this section we analyze in more detail the various impediments to mobility in more details.

4.1. The Separation Wall
According to UNOCHA (2012), the Separation Wall's total length is approximately 709 km, 62.3% of it has been constructed; a further 9.1% is under construction and 28.6% is planned but not yet constructed. When it is completed, the Wall will isolate approximately 9.4 percent of the West Bank territory from its main area (UNOCHA, 2012). According to a recent report by the Israeli Human Rights group B'Tselem (B'Tselem, 2012), the Separation Wall has completely destroyed many economic ties between Palestinian business owners in communities all over the West Bank, as the movement of people and goods have become highly restricted.[5] UNOCHA(2012) adds that "The barrier has also cut off land and resources needed for Palestinian land and development, resulting in the curtailment of agricultural practice."

4.2. Access to East Jerusalem
Since the mid of the year 2000, East Jerusalem has been almost completely cut off from the West Bank, by the Separation Wall, by the small number of checkpoints that lead to the city, and mainly by a strict regime of almost no entry from the West Bank to East Jerusalem. The closure of East Jerusalem from the West Bank and Gaza Strip businesses is a major loss to Palestinians, since the East Jerusalem market is an important and integral part of their markets. The losses are estimated in tens of millions of dollars annually, which for Palestinian producers is a large sum of business that is not easily recoverable. Another result of this closing of East Jerusalem for Palestinians is that it de facto splits the north of the West Bank from its south. In the past the territorial link between these two regions went mainly through East Jerusalem. Today it goes through roads to the east of the Jerusalem Separation Wall. These are much longer streets of much lower quality, which makes traffic much more hazardous. This clearly increases significantly the cost of mobility between the various parts of the West Bank.

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5. B'Tselem 2012. Arrested Development Report on the Long Term Impact of the Israel's Separation Barrier in the West Bank.

Tourism is an important area where the closing of East Jerusalem is crucial. East Jerusalem is central to tourism development in Palestine as a whole, as it is an important destination for tourism, both general and religious purposes of Christians and Muslims from all over the world. The construction of the Wall and the restrictions on movement through its passages highly restricts tourists' free movement. Therefore, it greatly limits the ability of Palestinians to use tourism in East Jerusalem as a lever to increase tourism in other historical and touristic attractions in the West Bank. Furthermore, tourism in Palestine has lost opportunities to welcome Muslim tourists from countries that do not have diplomatic relations with Israel; since they are not allowed to access Palestine, mainly by denying their visa. The potential embodied in Muslim pilgrims who can visit East Jerusalem to complete their Hajj is enormous. The annual number of Muslim pilgrims in Saudi Arabia during the pilgrimage period is 2 million, and this is the amount of potential pilgrims who could visit Palestine, if Israel's restrictions were lifted. The estimate is that such tourism could double the income from tourism in Palestine, from 3% to 6% of GDP.

4.3. Movement Restrictions within the West Bank

Movement of Palestinians inside the West Bank is restricted by a combination of physical obstacles – checkpoints, roadblocks and the Separation Wall – and by bureaucratic constraints, such as permits and areas that are closed or restricted to Palestinians. These restrictions are compounding the fragmentation of Palestinian Territory and increasing the difficulty of doing business or promoting investment. These restrictions affect the access of businesses to markets, increases the cost of transactions through greater transportation costs, through delays, and through increased risk due to unpredictability of movement and unreliability of access determination, which is vital for business commitments to delivery of goods and services. Restrictions to access to the land and to water resources also undermine productivity of the agricultural sector, which is important in Palestine. In 2013, some 180,000 Palestinians were forced to take detours two to five times longer to reach their destination. But this is of course an underestimate of this effect, as we don't know the number of Palestinians who did not do the way at all, once it became so costly. Furthermore, access to 43 percent of the West Bank, mainly in area "C," remains largely off-limits to Palestinian use, earmarked instead for the use of Israeli settlements.

Tables 4 and 5 below present mobility restrictions and how they changed over time since the end of the second Intifada. Sources for these tables are taken from the annual reports of UNOCHA (Movement and Access Maps). Table 4 describes the obstacles by regions (governorates), while Table 5 presents barriers by method of operation. Table 4 reveals that the total sum of obstacles did not decline much over time, contrary to declarations of Israel. There were regional changes in the intensity of movement barriers, but not in the overall burden. In one hand, Nablus, which was practically under siege during the Second Intifada, witnessed a decrease in the number of barriers from 117 in 2005 to 68 in 2014. Hebron, Jenin, Bethlehem and Jericho also enjoy an overall reduction. On the other hand Tubas, Qualqilya, East Jerusalem and Hebron H2 suffered from an increasing number of obstacles, while in the three remaining governorates: Ramallah, Tulkarem and Salfit the level of barriers has remained the same as nine years ago.

Table 4: Movement Barriers in the West Bank by Governorate: 2005-2014

	2005	2006	2007	2008	2009	2010	2011	2012	2014
Jenin	30	22	17	21	21	13	13	11	16
Tubas	6	10	10	13	14	12	14	14	14
Tulkarem	23	30	22	26	28	31	26	26	25
Nablus	117	86	102	128	117	80	82	77	68
Salfit	34	30	33	36	35	27	28	32	32
Qualqilya	11	10	20	20	29	33	37	36	34
Ramallah	93	64	82	97	97	103	104	93	101
Jericho	14	14	11	14	14	12	13	10	9
Jerusalem	43	43	40	41	41	53	51	56	59
Bethlehem	53	35	30	32	27	23	24	26	23
Hebron	181	174	191	202	191	117	127	151	109
Sub–Total	**605**	**518**	**558**	**630**	**614**	**504**	**519**	**532**	**490**
Hebron H2[6]	0	0	0	58	56	60	96	96	95
Grand Total	**605**	**518**	**558**	**688**	**670**	**564**	**615**	**628**	**585**

Table 5: Obstacles by Type of Operation: 2005-2014 (w/o H2)

	2005	2006	2007	2008	2009	2010	2011	2012	2014
Green Line	0	0	8	8	8	8	9	9	10
Permanent	57	68	67	75	68	64	60	59	60
Partial	7	8	20	18	23	25	26	28	25
Sub-total Staffed obstacles	**64**	**76**	**87**	**93**	**91**	**89**	**86**	**87**	**85**
Roadblock	118	50	68	68	69	66	59	62	61
Earthmound	282	275	209	230	203	162	194	185	147
Earth wall	35	15	25	46	50	20	22	24	26
Trench	55	10	17	22	21	10	8	8	9
Road Barrier	0	25	67	74	75	45	45	50	57
Sub-total Unstaffed obstacles	**490**	**375**	**386**	**440**	**418**	**303**	**328**	**329**	**300**
Road Gate	51	67	85	97	105	112	105	116	105
Grand total (w/o Green Line)	**605**	**518**	**558**	**630**	**614**	**504**	**519**	**532**	**490**

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6. Hebron H2 is the Israeli controlled area in Hebron which is separated from the rest of the city by many obstacles. It seems that recording the obstacles in this area started only in 2008.

Table 5 reveals a shift from unstaffed to staffed obstacles. At the beginning of 2008, there has been a gradual transition from permanent checkpoints to partially staffed checkpoints and to road gates, which are generally open. The number of manned obstacles almost doubled throughout the period, whereas the number of unmanned obstacles declined. Also the number of earth-mounds and trenches declined, too. However, caution should be taken with regard to these numbers, since the period of putting a barrier is crucial in evaluating its impact. Most importantly, the tables do not include flying checkpoints.[7] These are hard to record, but they might be even more disruptive due to their unpredictability and the longer delays they inflict. For these reasons, the number of obstacles is not a sufficient statistic for the degree of reduction of mobility, and yet it give a sense of the dynamics of barriers in the West Bank. The fact that the Palestinian economy did not follow up as it supposed to be since the end of the Second Intifada is related to the insufficient ease in access and movement restrictions.

Moreover, additional time and distance created by the checkpoints regime affect both workers and goods. A World Bank report from 2011 found a spatial unemployment pattern in the West Bank. The main findings are concentration of "unemployment pockets" in the area of Hebron and west of Ramallah because they were highly dependent on Israel for employment, and because the second intifada remained with excess supply of labor. Barriers to mobility of workers affect also businesses as well, since commuting workers become more expensive. Barriers also make commercial transport more costly and may lead producers to cut back on production. In addition, barriers have not only a direct effect on transport costs, but also indirect, due to increased uncertainty. For example, transport companies tend to commit to only one or two trips a day in certain routes, which reduces utilization of trucking fleets and raises fixed costs per kilometer. Also, many alternative roads were not made for commercial trucks - a fact that increases maintenance costs as well as driving time (World Bank, 2008c). The barriers affect inter-regional travelling as well as the movement within a governorate, since the movement between the center and close towns and villages take longer roads and time. This increases separation between economic centers and their potential pool of consumers, workers and suppliers. A major effect is recorded with respect to internal trade patterns. In 2000 nearly 60% of West Bank enterprises made a significant share of their sales outside their home city, while in 2006 this number had dropped to less than 40% (World Bank, 2008b).

4.4. Back to Back

Likewise the system of transferring goods from Palestinian to Israeli trucks at security checkpoints along the barrier, which developed into borders crossings is considered an additional threat. This method of unloading and reloading is known as 'back -to- back' and it adds to the cost of transportation and increases the potential for delays in moving goods. The back to back system forces Palestinians to use Israeli trucks, which cost more than Palestinian trucks in delivery either to Israeli buyers, or to Israeli ports to be shipped abroad.

In addition to increasing costs, the back-to-back system, which is imposed on trucks leaving the West Bank since 2005, leads to fewer loads per truck, due to the risk of damage as well as other costs of using two different cargo companies. The transfer of raw materials from one truck to another, costs about $80. Vegetable exporters reported that the back-to-back arrangement created on average a 24-hour delay, crucial in this industry of fresh produce (World Bank,

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7. Flying checkpoints are defined according to OCHA as: "checkpoints deployed on an ad hoc basis in places without pre-existing infrastructure" (OCHA, 2010)

2008). Furthermore, Garb (2008) estimates that back-to-back facilities at Tarqumia Crossing, for example, cause an average waiting time for Palestinian trucks of over an hour and a half, which add at least 15% to the cost of transport. The travel costs caused by the back-to-back method are estimated by Garb to be almost 50% higher than the costs under free movement conditions.

4.5. Gaza Siege

Gaza people are banned from traveling through the Erez Crossing by the Israeli authorities, they are banned also from traveling to the West Bank. Access to land within 300 meters from the fence surrounding Gaza is generally prohibited, and access to farming areas several hundred meters beyond is risky, due to the enforcement of access restrictions. Fishermen are allowed to access less than one-third of the fishing areas allocated to them under the Oslo Accords: six out of 20 nautical miles. In addition, to that Israel has damaged in its military operations in Gaza much infrastructure, including water systems, electricity systems, the airport and more. This worsened dramatically in the summer of 2014.[8] A recent estimate of the cost of the blockade on Gaza, ARIJ (2011), reaches a cost of 1.908 billion USD at 2010 prices. This amount is equal of one quarter of total Palestinian GDP.[9] Etkes and Zimring (2015) study the economic consequences of the siege on Gaza, using the West Bank as a counterfactual. They have come up with the conclusion that the economic restrictions lead to reallocation of resources from manufacturing to services and to reduction of labor productivity. This has decreased social welfare, as estimated by expenditure levels of private consumption before and after the beginning of the siege.

The major economic cost is Gaza's inability to trade, with the West Bank, and internationally. According to ARIJ, this issue by itself increased the costs of inputs, mainly because the economy in Gaza is small and dependent on imports for production and consumption. The Siege has a major impact on water supply and electricity production. According to a World Bank report in 2009, 50% of households in that year were without access to water network due to damages caused to the network throughout the Israeli bombing during "Operation Cast Lead". This damage was never fixed due to the Israeli prevention of entry of the needed construction materials needed to repair the network. At the same time, most water wells stopped working because of lack of spares for pumps, also due to the blockade. In addition, the only power plant in Gaza was severely damaged by Israeli bombing at that time, and is still suffering from the lack of spare parts and from a shortage of diesel fuel; which is imported from Israel and is restricted under the blockade. The power plant suffered from a new attack in 2014. The severe fuel and electricity shortage results in outages of up to 12 hours a day (UNOCHA, 2012). Besides, Israel prohibits entry of gas to Gaza. All of these steps left the economy of Gaza with insufficient basic inputs, which drove many businesses to collapse.

5. Effects of Barriers to Mobility on Productivity

The various restrictions on mobility in the Palestinian areas and between them received much attention and several studies tried to estimate their adverse economic effects. These estimates include reports by the World Bank, by the UN, by ARIJ and other agencies. There are even some academic economic studies that try to estimate the economic costs of such restrictions, mainly on labor markets. One such study is by Cali and Miaari (2013), which finds that the costs of

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8. The work on this paper went on mainly in 2013 and hence it does not include information on the damage of the conflict in the summer of 2014.
9. See ARIJ 2011.

barriers to mobility on wages of Palestinian workers are significant. In a recent Ph.D. thesis, written in Brown University, Abrahams (2014) examines separately localities that supply labor and localities that demand labor. He finds that the costs are concentrated in towns and villages that supply labor and do not have much employment opportunities. In all these papers the focus is on the direct costs and aggregate costs of barriers to mobility. We follow in this paper a different strategy. We try to estimate, in a very preliminary way, the costs of barriers per unit of good transferred and not the total costs. Then, we use this additional cost of transportation per unit to estimate by how much productivity declined as a result of these higher costs. Later on, we compare this estimation to our above mentioned results, from the Macroeconomic analysis of growth accounting which state that there has been a significant decline in aggregate productivity from the mid of 1990s to the mid of 2000s and in Gaza, and a renewed decline in the years 2005-2007. Accordingly, we examine by how much this decline is because of the impediments to mobility.

To begin with, we will consider an estimation of the additional costs of transportation in Palestine, which is taken from the report on "Doing Business" prepared jointly by the World Bank and the International Finance Corporation in 2015, using 2014 data. The following table compares the transportation costs of exports and imports for Israel and Palestine:

Table 6: Costs of Exports and Imports in Israel and Palestine

Type of Cost	Israel		Palestine	
	duration (Days)	Cost ($US)	duration (Days)	Cost ($US)
Export				
Documents preparation	4	110	10	325
Customs clearance and inspections	1	110	6	300
Ports and terminal handling	3	200	3	300
Inland transportation and handling	2	200	4	825
Total Cost to export (USD per container)	10	820	23	1,980
Import				
Documents preparation	4	120	17	320
Customs clearance and inspections	1	7.0	10	285
Ports and terminal handling	3	200	7	370
Inland transportation and handling	2	175	4	450
Total Cost to Import (USD per container)	10	665	38	1,805

Source: "Doing Business 2015", Trading Across borders.

Note that both exports and imports are done at the same ports, using the same shipping lines and are formally within the same trade regime, due to the Paris Protocol. The differences in cost are due to checkpoints, back -to- back system and other transaction costs. One shall note also that the monetary costs are direct costs, but they can increase if we add the cost of waiting between 13 to 28 more days for the transaction to be performed. Therefore, we can conclude that moving a container is much more costly for the Palestinians, and the additional direct costs are around $1,200 per container. If we add the cost of time, assuming that any day costs at least $20, then additional 20 days on average sum up in $400. That raises total costs to $1600 at least. The overall costs are, of course, higher, since many costs cannot be quantified, like the costs of shutting down traffic from Gaza entirely. Adding mobility costs to the cost of production not only by making transports of goods more expensive, and increasing the costs of labor and other inputs as well. That is not shown in Table 6, but we can add it to our estimates for sure.

Afterward, we use the estimate for additional costs of transportation, to infer from it the decline in productivity. Appendix II presents a model calculation of the decline in productivity due to barriers to mobility. It shows that the decline in productivity is equal to b times Q^*/Y, where b is the dollar additional cost due to barriers per dollar value of merchandize, and Q^*/Y is the ratio between quantity produced and output (value added) in an economy without barriers to mobility, for example: as in Israel. This variable differs from one sector to the other.

Let us consider first the agricultural sector, the value of a 20 feet container of fresh agricultural goods is between $7,000 to $10,000. Since the additional costs per container are at least $1,600, the value of b in this sector should be between 16% to 23%. The ratio between production Q^* and output Y in agriculture in Israel was equal in 2010 to 2.1. Hence, multiplying this ratio with b shows that the decline in productivity in agriculture due to barriers to mobility was between 34% and 45%. This is not far from the overall decline in productivity in the 1990s and the early 2000s, which was around 40%. Actually, the World Bank (2014) estimates that productivity in agriculture sector declined by 50% between 1995 and 2011. We can conduct a similar calculation in the food industry. The value of a 20 feet container full of processed food is around $20,000. Hence b in this industry is at least 8%. The product to output ratio of this sector in Israel is 1.4. Consequently, the calculation above yields a loss of productivity of 11% in the food industry. One shall note that taking the figure of Q^*/Y, product relative to added value, from Israeli data is problematic. Palestinian producers use much less capital, as noted above. As a result, this ratio should be much higher for them. This implies that the decline of productivity implied by our calculation should actually be much higher.

Also note that the costs in Table 6 are only part of the actual costs of mobility, due to longer routes, closed areas, and other reasons. Our calculations are only partial, but they show that much of the decline in productivity in the first ten years of the Oslo Accords can be attributed to increasing barriers to mobility. This conclusion is further supported by the decline in Productivity in Gaza in the years 2005-2007, when productivity declined by 30% within less than 3 years. This is clearly strongly related to the siege of on Gaza.

6. Impediments to Investment Caused by the Occupation

As shown in Section 3, the poor growth record of the Palestinian economy should be partly attributed to the decline in productivity until 2003, and to the lack of capital deepening. This raises the question that are, why investment in Palestine is so low? and why capital does not follow the changes in productivity throughout periods when productivity is on the rise? In this section, we try to list some samples of living under occupation adversely affects investment, and to claim that these effects are significant enough to explain the low investment record. The deterrents of investment have various types, mainly the risk of investment in Palestine, the impediments to trade, regulatory impediments of various types, limited access to most of the available land in the West Bank and more. Interestingly, the World Bank reaches similar conclusions. In 2007, it conducted a West Bank and Gaza Investment Climate Assessment (ICA). The findings of this ICA, which included a survey of enterprises throughout West Bank and Gaza strip, reveal that shrinking market access and the lack of free movement are the main constraints to growth for Palestinian enterprises. Relative to other countries in the region, the Palestinian investment climate is acceptable: petty corruption is low, the bureaucracy is relatively efficient and financial markets are well developed. Despite this, Palestinian enterprises have not invested enough to maintain their international competitiveness.

More support to our claims on impediments that investment can be derived from data on size of businesses. The average size of an industrial establishment is 5 workers, which is considered a micro establishment in any country. The share of micro (1-4 workers) and small (5-9) establishments in the West Bank is 92%, according to the PCBS enterprise survey from 2012, and this rate is similar to the one reported in the 2007 enterprise survey. Moreover, only 23 establishments in the entire West Bank employ more than 100 individuals. The Palestinian enterprises' extremely small size limits their ability to reach minimum efficient economies of scale. Figure 7 presents the size distribution of the manufacturing sector by districts in 2007 and in 2012. The green marks are the total number of establishments in each governorate and the bars show the size distribution of establishments with less than 10 employees. According to Figure 7 the number of small establishments has neither changed dramatically during the last 6 years, nor has their share in the total number changed. However, there has been a slight increase in the number of small establishments over microenterprises. While cross section view of the share of establishments with less than 10 employees in each governorate reveals that all governorates have about a 90% share of micro and small establishments.

Figure 7: Micro and Small Establishments by Governorates (2007, 2012)
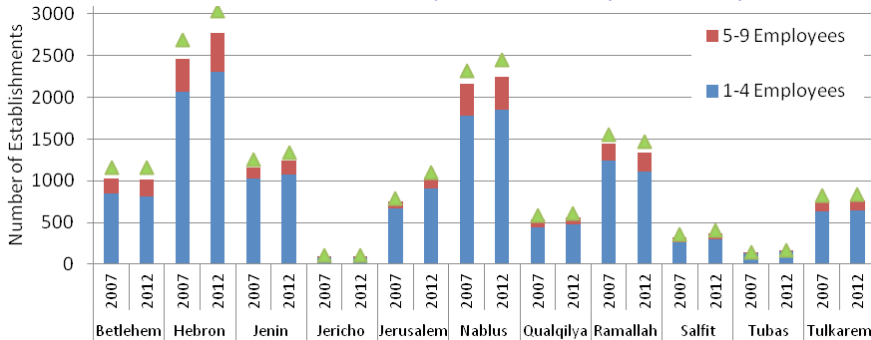
According to the World Bank Enterprise Survey in 2013, labor productivity is about $30,000 for the median large firm in the West Bank and Gaza strip, compared to about $10,000 for the median of small and medium-sized firms. Differences are also found on a regional level as the median firm in East Jerusalem produces about $23,000 of output per worker as compared with only $10,000 for the median firms in the West Bank, and about $6,800 for the median firms in Gaza (World Bank, 2014). These regional differences can also be explained by the impediments to investment discussed below.

6.1. Administrative Impediments

The Israeli administration has limited the ability of Palestinian to invest from the early days of the occupation in the year 1967. One reason was to reduce as much as possible the willingness of Palestinians to work within their territory and thus to attract them to work in Israel. Another reason was the pressure of some members of the Israeli business community, especially those who export goods to the occupied territories. They preferred to have as less competition as possible. The army, indeed, was in position to restrict investment significantly, as any operation needed licensing. Since the beginning of the establishment of the Palestinian Authority, this full control of the army in licensing has been reduced, but investments are controlled through other means. Note that most invested goods are imported, and since all imports pass through the Israeli ports they are still under control. One such type of control is well known as 'dual use.' These are machines and materials that can be used militarily, in addition to their civil use, therefore, import of such goods is prohibited. When used extensively, this is a serious impediment to investment. Another form of administrative constraint on investment are permits to build in many areas in the West Bank, mainly in Area 'C.' It is known that construction is considered a large part of investment (more than half of capital in the advanced countries is structures, even more so in Palestine). It is also known that such permits are not granted in large areas of the West Bank. Hence, restrictions on building permits affect the investments.

Another indication for administrative impediments to investment is the ill performance of the Joint Investment Committee (JIC). This is part of the Israeli – Palestinian Joint Economic Committee, which was created by the Paris Protocol to address all issues related to investor's access and promotion of investment in Palestine. This joint committee has failed to meet since late 2000 - with the exception of meetings held for the purpose of Palestinian investment conferences in 2008 and 2010. This poor record of performance is an indication in itself.

6.2. Risk

The political instability caused the occupation is a major impediment to investment in many ways. Investment in the Gaza Electric Plant, for example, arrived from local investors, the Palestinian government in the form of the Palestine Investment Fund, donor contribution from various European Donor Countries and private foreign investors. In 2006, Israel bombed and severely damaged the power plant's three turbines, which supply about a third of the electricity used by Gaza's 1.5 million residents. Since the 2006 bombing, Israel has further crippled electricity supplies by severely limiting the transfer of spare parts and fuel into Gaza. Upon the Israeli invasion of the Gaza Strip in 2008/2009, the Israeli Air Force bombed around the power plant, thereby destroyed significant part of the re-investment. During the Gaza war of 2014, the same power station was bombed again. This is an example that has an effect not only on this investment, but on potential foreign investments in the

Palestinian economy as a whole. This damage to such productive capacity causes power shortages that sometime can be for up to 12 hours per day.

6.3. Access to "Area C"

Given the fundamental importance of land to economic activity and development, the impact of continued Israeli full control of "Area C" (61 % of the West Bank) cannot be underestimated. Land is a common means of storing wealth and a powerful economic asset. It is an important economic input in every sector, and especially in sectors such as agriculture, industry, housing, and tourism. Thus, the effects of the limits on "Area C" on the Palestinian economy and investment are large. The land use and planning regulations in "Area C" limit development within existing villages, restrict space for demographic growth and create environmental risks. As expected, economic activity in "Area C" is limited primarily to low intensity agriculture. High intensity agricultural, industrial, housing, tourism, and other investments are hindered by the lack of construction permits from the Israeli authorities and the limited amount of titled land available. This is shown in the Economic Monitoring Report to the Ad Hoc Liaison Committee (2010).

According to the 1993 Oslo Accords, "Area C" was supposed to be gradually transferred to the Palestinian Authority (PA) for full control and administration.[10] This has never occurred. On the contrary, the Israeli administration confiscated many areas to establish settlements in "Area C." As a result the fragmentation of Palestinian land is increasing due to continuous establishment of new Israeli settlements and outposts, which disconnect Palestinian communities and cities.[11] According to the World Bank, the areas controlled by settlers exceed 68 percent of "Area C". This has significant economic implications. Only 1% of "Area C" is already built up for Palestinian use and only 18 to 20 percent is accessible agricultural land.[12] The remainder of the area is heavily restricted or off-limits to Palestinians. In fact, even the small percent is practically unavailable and inaccessible for Palestinians for use and development, since it still requires Israeli licensing, which is close to impossible to get.

According to the same report: "Freeing economic activity in "Area C" would have a particularly high impact on the development of businesses in agriculture and Dead Sea minerals exploitation, stone mining and quarrying, construction, tourism, and telecommunications." That of course would indirectly benefit other sectors as well. The World Bank report estimates that if businesses and farms were permitted to develop in "Area C", 35 percent would be added to the Palestinian GDP. This will have a strong effect on other sectors in the economy, but also on fiscal policy and on fiscal stability as well. The World Bank found that Palestinian economic activity in "Area C" will directly benefit most the sectors of agriculture and Dead Sea minerals, which are currently under full Israeli control. The Bank also considered construction, telecommunications and tourism as key sectors for the development of the Palestine, and which are constrained by the lack of access to Area "C". It is estimated that the potential additional output from these sectors would amount to at least $2.2 billion annually, which is 23 percent of the

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10. The Oslo Accords, Annex I: Protocol Concerning Redeployment and Security Arrangements, Article I—Redeployment of Israeli Military Forces and Transfer of Responsibility. Oslo II defines "Area C" as: areas of the West Bank outside Areas A and B, which, except for the issues that will be negotiated in the permanent status negotiations, will be gradually transferred to Palestinian jurisdiction in accordance with this Agreement .

11. See UN Committee on the Elimination of Racial Discrimination Eightieth session. Israel Report: Concluding observations of the Committee on the Elimination of Racial Discrimination. March 09, 2012. and see Al-Haq 2012. "Apartheid, segregation and institutionalised racism: UN Committee "Appalled" by Israel's Racial Discrimination." March 14, 2012

12. World Bank, 2013. "West Bank and Gaza: Area C and the Future of the Palestinian Economy", p. 4

Palestinian GDP of the 2011. This estimate might be even higher if the supply of water to the area would be increased as well. Note that one sector that can benefit from access to "Area C" is quarrying. Currently, stone mining and quarrying industrial sector is the largest Palestinian exporter, based on the well-known «Jerusalem Gold Stone.» This industry suffers from the inability to obtain permits to open new quarries in "Area C", or renew existing ones. "If these restrictions are lifted, we estimate that the industry could double in size, increasing value added by some USD 241 million - and adding 2 percent to 2011 Palestinian GDP."[13]

"Area C" is also important for the housing sector, since currently population density in Areas A and B is very high. Another sector that depends crucially on access to "Area C" is tourism. The reason is that many of the tourist attractions in Palestine are in "Area C" or require passing through this area to reach them easily. Hence, a development of such industry is seriously delayed by these restraints. It is also important to note that road building through "Area C" can significantly reduce distances and raise overall productivity.

6.4. Impediments to Trade

The Palestinian-Israeli economic cooperation and trade relations are governed by the Paris Protocol, which was signed in 1994 between the Palestine Liberation Organization (PLO), representing the Palestinian people and the Palestinian Authority of the West Bank and the Gaza Strip, and the Government of Israel, as Annex V of the Oslo Accords. Since its signature, and apart from the fact that the protocol has already expired more than 15 years ago, there were no significant adjustments to its articles, despite the fact that the reality on the ground changed dramatically. The main underlying principles of the Paris Protocol are creating customs union, guaranteeing free movement of goods to the Israeli market and through Israeli ports and airports to the international market, and the potential of creating a future Palestinian Tariff Book.

But the Paris Protocol did not take into consideration a situation where there is no free mobility for people and goods between Israel and Palestine, and within the Palestinian areas itself. Therefore, the combination of the customs-union trade regime with the many Israeli restrictions has made the Palestinian market a captive market for Israel. Imports from Israel accounted for 70-75 percent of all Palestinian imports over most of the 2000s. Israel remained practically the dominant market for Palestinian exports as well, absorbing about 90 percent of total Palestinian exports in this period. As a result, Palestine has developed a huge structural trade deficit.[14] This deficit increased from $1 billion in 2002 to $3.5 billion in 2011 and 2012.

Israel is also blocking trade agreements signed by the Palestinian Authority with many countries. The Paris Protocol opened the door for the Palestine Liberation Organization (PLO) on behalf of the Palestinian Authority to sign trade agreements with trade partners such as the EU, EFTA and others, as long as they do not derogate from the principles of the customs union, on which the Paris Protocol was based. Once these agreements were signed, Israeli customs, opposing such agreements, simply refused to recognize them and refused to clear Palestinian imports under these agreements, thereby causing additional costs and delays to the products, and reducing their ability to compete against similar products imported by Israeli traders to be sold in the Palestinian market. Such impediments also reduce the incentives to invest.

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13. See World Bank, "West Bank and Gaza: Area C and the Future of the Palestinian Economy".
14. PCBS, Foreign Trade Statistics.

7. Potential Loss of GDP

This paper shows that Palestinian development has been very low during the last twenty years. This has been a result of declining productivity and also of lack of capital deepening. In this section we examine how much could the Palestinian economy grow in the absence of these impediments, which are caused by the occupation. Such calculations are of course highly speculative and hence cannot be very accurate, but we need to make them nonetheless. It is better to have an imprecise estimate than to have no estimate at all. We just warn that these results should be taken with some caution. We also present two alternative calculations in order to add robustness to our results.

We begin to measure the dynamic economic costs of occupation to Palestinian economic growth by conducting a counterfactual exercise. We ask what would have been the level of GDP per worker in Palestine at 2011 if the Palestinian economy would have been on a sustainable growth path. We consider two such possible growth paths. The first counterfactual exercise assumes that the average growth rate of Palestinian productivity, namely TFP, throughout the period, has been the same as after the Second Intifada. We then assume furthermore that investment has been free so that it could deepen capital in accordance with the changes in productivity. The second counterfactual assumes that the average growth rate of Palestinian GDP per worker is equal to the growth rate of Jordanian GDP per capita. The results are very revealing: we find in the first scenario that Palestinian GDP per worker would have been higher by 72% by 2011 than its actual level, while in the second scenario its level would have exceeded its actual level by 85%.

7.1. First Scenario

In this scenario we analyze what would have been the level of TFP had the Palestinian economy grown since 1996 by the same growth rate as in the West Bank after the Second Intifada. The period after the Second Intifada is characterized by a relatively sustainable growth in the West Bank. In this period, from 2004 until 2011, TFP grew at an average annual rate of 2.43% (note that this is a lower bound, since part of the period experienced a decline in productivity due to the events in Gaza). If we apply this rate of growth of TFP to the whole period in all Palestine we get that TFP would have grown by 43.5%. If we have capital deepening the increase in GDP per worker should be higher by a factor of 1.5. Hence, GDP per worker would have been 72% higher than its actual level. We conclude that the increasing impediments to movements within Palestine and between Palestine and the rest of the world and impediments to investment caused a loss of at least 72% to GDP per worker. This is translated to a loss of similar proportion to GDP per capita. Of course, the decline in income was much higher due to loss of jobs in Israel throughout this period.

7.2. Second Scenario

As mentioned above, our second counterfactual exercise is to analyze what would have been the Palestinian GDP per worker in 2011, had the Palestinian economy grew at the same average rate as Jordan in the same period. We choose Jordan, since it resembles the Palestinian economy in several aspects: It is a small open economy, with population of a similar size. Like Palestine, it is a non-oil-producing Arab economy; and its main sectors are agriculture and construction. We use data from the World Bank, according to which between the years 1996-2011, Jordanian GDP per capita grew by an average rate of 2.6% per annum. We then compute what would have been the Palestinian GDP per worker in 2011, had the economy

grown at this rate, and we find that it would have been 85% higher than its actual level. Interestingly the two results are not too far away from one another.

Finally, we would like to note that our estimates in this Section are only partial. Impediments to investment themselves cause a delay in technology adoption and hence in the growth of productivity, of TFP. This is because many technologies are embedded in machines, like computers, like tractors, etc. Therefore, constraints on investment might be translated to constraint on growth of TFP as well. In other words, limited investment causes an economy not to fully apply any rise in productivity, and it reduces the rise in productivity itself. This understanding is quite new in economic research, so we do not know yet how to estimate its effect quantitatively, but it is clearly significant. Consequently, it is important to keep in mind that our estimates of lost output in Palestine are partial, and the actual losses should be even higher.

8. Summary and Conclusions

This paper focuses on one important cost of the Occupation to the Palestinians, on the slowing of economic growth. We begin by observing that in the last 20 years GDP per worker, or what is called the labor productivity, has not increased and it even declined over these years by close to 15%. Next, we use the standard tools of analysis to study economic growth within a country and find out that the lack of economic growth was caused by two reasons. The first is the decline in Total Factor Productivity (TFP) in the initial years after the Oslo Accords, namely in 1994-2003. The second is the lack of sufficient investment throughout the whole period. It seems that instead of capital deepening Palestinian businesses keep the level of capital to labor constant. Then, we claim that these two causes of decline were caused by the Occupation. The decline in productivity in the years 1994-2003 was caused by the increasingly harsher barriers to mobility, within the West Bank, from the West Bank to Gaza, from the West Bank to East Jerusalem, and from the two Palestinian areas to the outside world. The impediments to investment were caused by a myriad of means, mainly administrative constraints, huge risk, limited access to "Area C", and more.

We then show that these two developments, falling productivity during 1994-2003 (and some additional decline after 2005, mainly in Gaza), and limited investment in capital, cost the Palestinian economy a decline of GDP per worker of 70-80 percent. This is a very significant cost. But as it is mentioned in Section 7, the cost is actually much higher and output in Palestine could grow even by more in those crucial 20 years since Oslo Accords. That is sad, but it is also saying something about the potential that lies ahead. If the Palestinians can regain their independence and begin their economic development, they will be able to rush forward quite fast. Doubling GDP per worker in each fifteen years might not be imaginary, at least in the first decades. Israel did it in the 1950s and the 1960s. The Palestinians can do it too.

Appendix I: Output and Productivity

Assume that output is described by the Cobb-Douglas production function:

1. $Y = AK^{\alpha}L^{1-\alpha}$.

We calculate A by using the method of growth accounting. We calculate it over time using the following rate of growth equation:

2. $\dfrac{\Delta A}{A} = \dfrac{\Delta Y}{Y} - s_K\dfrac{\Delta K}{K} - s_L\dfrac{\Delta L}{L}$.

The coefficients sK and sL are the shares of capital and labor in GDP, respectively. In the case of the Cobb-Douglas function $s_K = \alpha$. Calculating the rate of change of A helps us to construct a series of A by assuming an arbitrary initial value.

Next we calculate equilibrium output under two alternative setups. One is full capital mobility and free investment, and the other is constrained investment. In the first case we get:

3. $MPK = r + d$

where r is the global interest rate and d is the rate of depreciation. Calculating the marginal productivity of capital and substituting in (3) we get the following equilibrium amount of capital:

4. $K = L\left(\dfrac{\alpha A}{r+d}\right)^{\frac{1}{1-\alpha}}$.

Substituting (4) in the production function (1) yields the following output per worker:

5. $y = \dfrac{Y}{L} = A^{\frac{1}{1-\alpha}}\left(\dfrac{\alpha}{r+d}\right)^{\frac{\alpha}{1-\alpha}}$.

In natural logarithms we get:

6. $\ln y = \dfrac{1}{1-\alpha}\ln A + \dfrac{\alpha}{1-\alpha}\ln\dfrac{\alpha}{r+d}$.

Assuming that r and d are constant over time and that α is close to 1/3 we can calculate the equilibrium output per worker in this case, as driven by the rise in productivity.

An alternative assumption is that investment is significantly limited and as a result capital is not reflected by (3), but is assumed to be of a fixed proportion of labor only. Namely, it is assumed that the capital labor ratio in the economy is constant over time (we assume that capital accumulation takes care only of the physical depreciation and of the increase in the labor force). This assumption amounts to:

6. $K = k*L.$

We substitute this equilibrium condition in the production function (1) and get:

7. $y = \dfrac{Y}{L} = A(k*)^{\alpha}$.

In logarithms we get:

8. $\ln y = \ln A + \alpha\ln k*$.

Namely, the rate of change of output per worker is equal only to the rate of change of productivity. We can plot this graph as well and fit it at some point to output per worker and examine which model fits better the actual data of output per worker, (5) or (8).

Appendix II: Effect of Mobility Costs on Productivity

The (gross) profits from production are described by:

9. $PR = Q - IN - M - W$

Where PR are profits, Q is value of good produced, IN is the value of the intermediate goods used in production, M are mobility costs and W is the wage bill paid to the workers. Let us further assume that the amount of intermediate goods is proportional to the quantity produced: $IN = nQ$. Let us also assume that the cost of transportation is also proportional to the quantity produced, but the coefficient of proportion includes regular cost per unit (dollar) m and additional cost per unit due to occupation barriers to mobility, which we denote by b. Hence mobility costs are:

$$M = (m + b)Q$$

Substituting these costs in (9) and moving the wage bill to the LHS we get:

10. $PR + W = Q(1 - n - m - b) = Q(1 - n - m) - bQ.$

Note that the LHS is actually the gross output of the firm (value added), which is denoted by Y. Hence, we can write:

11. $Y = Q(1 - n - m) - bQ.$

Consider next a similar Israeli company, which does not face barrier costs. The output of this firm is equal to:

12. $Y^* = Q(1 - n - m).$

If we substitute (12) in (11) we get:

13. $Y = Y^* - b\dfrac{Y^*}{1 - n - m} = Y^*\left(1 - \dfrac{b}{1 - n - m}\right).$

This equation means that output in Palestinian firms is lower than that in similar Israeli firms by a factor of:

14. $\dfrac{b}{1 - n - m}.$

This is therefore the rate of decline of productivity due to barriers to mobility. Applying equation (12) we get that productivity declines by the following ratio:

15. $b\dfrac{Q}{Y^*}.$

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