The economic consequences of war and conflict in the land of Israel/ Palestine: 1914-2013

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Sadly, starting in the twentieth century and continuing through the beginning of the twenty-first century, there has been almost continuous conflict between Jews and Arabs in the land of Israel/ Palestine (IP). In addition, independent of this conflict, IP was drawn into WWI, with the British conquering the land from the Ottomans, and in WWII, IP became a major supply center for British forces. In this paper we will examine the economic consequences of the conflict between Jews and Arabs in IP, and the impact of the two world wars on the economy in the land. We begin with a review of all the wars that occurred in IP from 1914 to the present and the economic consequences of the wars. Afterwards, we will examine Israel's defense spending, and two externalities, one positive and one negative, that have arisen with regard to the Israeli economy due to the conflict. In the end of the paper, we evaluate each major instance in the conflict to determine whether and why the particular conflict had a positive or negative impact on the economy in IP.

I. The wars in IP from 1914-2009

In November 1914, the Ottomans joined with Germany and Austria-Hungary to fight against France, Russia and Great Britain, and in February 1915, Ottoman forces attempted to capture the Suez Canal, but they were repelled. Great Britain responded by invading IP, but initially they were held back in the battle of Gaza in April 1917. General Edmond Allenby was then made commander of the British forces, and he succeeded in capturing the southern portion of IP, including Jerusalem in December 1917. In September 1918, in the battle of Megiddo, Allenby captured the remainder of IP, and the British ruled IP as a mandatory territory until May 15, 1948.

Prior to WWI, the economy in IP was based on agriculture, with the orange industry starting to develop. However, during the war the orange industry was hardhit. There was a shortage of fuel to run the motors needed to irrigate the fields, and the orchards were unable to be maintained during the war.[1] The other mainstay of the economy, the olive industry, was also devastated since the Ottoman army needed wood to run the locomotives to transport the troops, and it is estimated that approximately 60% of the olive trees in the country were cut down during the war to provide fuel for the trains.[2]

Even prior to the Ottoman's official entrance to the war, all shipping to IP was halted, which ended all exports and imports from Europe, and the government declared a moratorium on its debt that caused a monetary crises.[3] The Ottoman government began to print money to pay for its war expenses, and prices began to rise in IP. For example, the prices of rice and sugar rose 700%, flour 200%, and other goods such as potatoes were not available at all.[4] In addition, as "part of the war effort," the government conscripted the local population, killed deserters without trials, confiscated crops and animals, and deported people suspected of working with the enemy. The only positive economic aspect to the war in IP was that the Ottomans invested in the infrastructure of the country (railroads and roads), but most of their work had to be re-done by the British afterwards.[5]

Towards the end of the war there was a famine in IP, Syria and Lebanon. McCarthy (1990) estimated that 4% of the Muslim and Christian population (29,535 out of population of 738,389 in 1914) and 2% of the Jewish population (1,200 out of a population 60,000 in 1914) died in the war. If these estimates are correct, then WWI had the largest number of fatalities of any war in IP in the subsequent ninety five years.

Under British rule the economy began to grow, again led by the orange industry. Initially there were generally peaceful conditions in the land, though there were periodic riots or disturbances, 1920, 1921, 1929 and 1933, but these were all short-lived. The first major wave of violence began in April 1936 with a boycott by Arabs of Jewish businesses and Arabs began to attack the British and Jews to protest Jewish immigration to Palestine. These attacks were labeled as the "Arab revolt" and the first wave of the revolt lasted to October 1936. The attacks began again in September 1937 and now the attacks also included killing Palestinians accused of collaborating and sabotaging the infrastructure in the country.[6] In the summer of 1939 the British succeeded in suppressing the revolt, but by then it is estimated that between three to six thousand Arab activists were killed.[7]

The Arab revolt caused a large downturn in the economy in Mandatory Palestine. Metzer (1998) provides estimates of real GDP in IP from 1922-1947, and according to his data from 1922-1935, the annual growth rate of real GDP from 1922-1935 was 12%, while from 1935-1939, the average annual growth rate of real GDP was negative 3.82%. During this downturn, citrus (oranges, grapefruit and lemons) exports more than doubled (7,334,3000 cases in 1935 to 15,264,8000 cases in 1939), but investment in citrus groves declined from 2,199,000 Palestinian Pounds (P£) in 1935 to P£ 663,000. In addition, there was a large fall in the construction sector. The value of output in construction declined from P£ 8,584,000 in 1935 to 2,025,000 P£ in 1939.[8]

The economy in IP rebounded with the advent of WWII. There was no fighting in IP during this war, but IP became a major supplier for British troops that were fighting in North Africa and Italy. There was a huge jump in IP's exports to Egypt. In 1938 and 1939, IP's exports to Egypt were P£ 100,000 in 1938 and 1939 and they increased to an annual average of P£ 4,000,000 in the years 1942-1944.

Both the agricultural and manufacturing sectors of IP boomed during WWII. There were large increases in the production of grains, potatoes, vegetables, milk and eggs, and IP supplied the British army with canned and processed food products, camouflage nets, 3 million antitank mines, dry-cell batteries, spare parts for machines, tanks, trucks and ships (including two complete minesweepers built in Tel Aviv), optical instruments and various medical supplies.[9] In addition, in 1938 an oil refinery (Consolidated Refineries Limited) became operational in Haifa based on oil that came via pipeline from Iraq. During WWII, the refinery's capacity was doubled and it became the main supplier of gasoline to the eastern Mediterranean.[10] Exports of petroleum products and fuel became the number one export item in IP, and average exports for the years 1942-1944 were £P 5,000,000, approximately 41% of total exports.

An article in *The Economist* (Garrison prosperity in Palestine, April 5, 1947, p.503) noted that IP's economy continued to boom after WWII due to British forces in Palestine. In the beginning of the 1947, there were 100,000 British troops in IP, five times more than had been in 1939, even with the Arab revolt.[11] The expenditure for these forces, which were borne by Great Britain increased from £ 2,841,000 in 1939 to £ 25,000,000 in 1944 and 1945 and £ 30,000,000 in 1946, which was around 20% of the total national income of the country.

On November 29, 1947, the UN voted to partition IP, which meant the removal of all British forces from the area. The Arabs did not accept the UN partition, and there began a civil war between the Jews and the Arabs, which lasted until the end of the British Mandate. Morris (1948, pp.96,97) noted:

> The civil war resulted in an economic divorce – cutting off many Arabs from their Jewish workplaces and closing the Jewish marketplace to Arab goods,

> especially agricultural products….By early March, commerce in Jaffa was reported at a standstill and fuel was scarce. Unemployment soared… Prices – of flour, petrol and other basic goods- also soared.

On May 15, 1948, the civil war ended, and there began a out war between the Jews of IP, who had declared the founding of the state of Israel, and the surrounding Arab countries. While there were various intermittent ceasefires, the last fighting ended in March 1949, and IP was split into three areas, Israel, the Gaza Strip, which was controlled by Egypt and the West Bank, which was ruled by Jordan. In terms of casualties, amongst the Jews/ Israelis, there were around 5,750 killed (a little less than 1% of the Jewish population prior to the war) and 12,000 seriously wounded. With regard to the Palestinians, it is unclear the number of casualties, either slightly higher or much higher.[12] In addition, many of the Arab residents of IP who before 1948 lived in the area of IP that became Israel became refugees either in the West Bank, Gaza, or the surrounding countries. The exact number of refugees is unclear. Morris (1948, pp.407,490) writes that there were 700,000, of whom approximately 67% went to the West Bank and Gaza, while *The Economist* ("Can the Arab refugees survive?" October 29,1949, p.953), writes "the most reliable guess is that there are at present 820,000 refugees in all, distributed as follows, 344,400 in Palestine and Jordan, 262,400 in Syria, Lebanon and Iraq, and 206,000 in Gaza." Clearly for these Arabs, the war was an economic disaster, as they lost their homes and fields. With regard to the Jewish population, Morris (1948, p.415) concluded:

> Economically, the war had done limited harm to Israel, in terms of manpower destroyed, homes and fields trashed, and production impeded. But this was largely offset by the massive influx of Jewish immigrants and financial contributions sent by the world, especially American Jewry and by the grants

> and loans that soon began to arrive from Western governments. A giant demographic and agrarian revolution took place that, within five years, led to the doubling of the Jewish population and of the number of settlements, with all that this implied in terms of agricultural productivity and demographic expansion and dispersions. To some extent, the war had also been beneficial to Israel's fledgling industrial sector.

There are no official data for Israel's GNP/ GDP in 1948 or 1949, but Barkai (2009, p.440) estimated that Israel's per capita GNP increased 7.06% from 1947 (Jewish sector of IP) to 1949, 9.89% from 1949 to 1950, and 9% from 1950 to 1951. Yet, there were major setbacks from the war to several of IP's largest firms prior to the war. The Palestine Electric Corporation's main power plant had been a hydro-electric dam on the Jordan River. This plant and dam were destroyed during the war and have never been re-built. The Palestine Potash Company's plant on the northern coast of the Dead Sea was destroyed in the war. After the war, the company was re-organized as the Dead Sea Works, and it began to extract potash from the southern basin of the Dead Sea. In addition, the oil refinery stopped getting oil from Iraq in May 1947 and the refinery remain closed until August 1950.[13] The pipeline has never been re-opened, and instead until the present, oil now arrives seaborne to the refinery.

Another major economic consequence of the conflict was the Arab boycott of Israel. During the mandate period, the entire Middle East had been a free trade zone, but the boycott ended all trade between the Arab countries and Israel. The boycott even included a secondary aspect that the Arab countries did not trade with a company that traded with Israel. The boycott would only lose its effectiveness in the 1990s, though it still officially exists.

In 1949, various armistices agreements were made between Israel and its neighbors, but the conflict remained on a "low flame." Due to Arab attacks, Israel suffered 1,300 casualties between 1949 and 1956,[14] and Israel responded with various counter-attacks and raids. In October 1956, there was a short war (8 days), called the Sinai campaign, between Israel and Egypt, in which Israel, in coordination with France and the British, captured the Sinai Desert and the Gaza Strip. Israel's casualties were 172 deaths and 700 wounded.[15] From Israel's perspective, the war was due to economic reasons, as Egypt had stopped all shipping from the port of Eilat (Israel's southern port) through its control of the straits of Tiran in the Sinai desert. In March 1957, Israel relinquished control of the land that it had captured in return for an Egyptian commitment to allow Israeli shipping through the Straits of Tiran.

The immediate effect of the war was costly to the economy, as reserves were called up for an extended period.[16] The rate of increase in Israel's GDP declined from 13.7% in 1955 to 8.9% in 1956 and 1957, which might be related to the war, though it is more likely that 1955 (and 1954 when GDP grew by 19%) was a unique year, as for the following ten years from 1956 through 1966, the annual growth rate of Israel's GDP was 9.37%.[17] With regard to Gaza, there is no data for this period to judge the effects of the war.

One positive aftermath of the war for Israel's economy was that the Israeli government began to develop the port of Eilat and the town's population increased from 600 in 1956 to 11,000 in 1967.[18] Another effect of the war was that Egypt expelled 23,000 to 25,000 Egyptian Jews from November 1956 to the end of 1957, and 13,500 of them immigrated to Israel.[19] Immigration has always been a major driver of the Israeli economy, and in 1957 immigration to Israel was 72,634 its highest level since 1951.[20]

In addition, after the war, there was a period of relative calm, possibly the most in the period being reviewed here, which lasted until 1967. In first half of 1967, Israel and Syria began to have fights over the water sources of the Sea of Galilee, and again Egypt closed all shipping to Israel through the Straits of Tiran. This led to the "Six-Day War" which began on June 5, 1967, between Israel, Egypt, Jordan and Syria. In the war, Israel captured the Sinai Desert, the Gaza Strip, the West Bank and the Golan Heights. 759 Israeli soldiers were killed, and approximately 2,300 were wounded, while the combined casualties (killed or wounded) for Egypt, Jordan and Syria were approximately 30,000.[21]

This war had a very positive impact on Israel's economy. In 1966, Israel was in the midst of a recession with GDP increasing by only 1% and per capita GDP falling by 1.6%. In 1967, there was only a small pick-up with GDP growing by 2.3%, but then GDP increased by 15.4% in 1968 and 12.7% in 1969. With regard to Gaza and the West Bank, again there is no data for the period prior to 1967 to make comparisons.

With regard to Israel, Kanovsky (1970, pp. 51) noted that "The economic upsurge which began in the last quarter of 1967 was due in part, to the sharp increase in local military spending. During the first year or year and a half after the war this permitted the utilization of previously idle labor and capital resources." There was also an increase in the financial support for Israel from Jews in the Diaspora. In addition, there was a major upsurge in investment in 1968, especially in the public sector companies.[22] Furthermore, Kanovsky (p.86) wrote, "Though difficult to quantify, the psychological stimulus of victory and the air of optimism… were powerful forces accelerating the economic revival and the rapid rate of expansion characterizing the postwar economy." Part of this feeling extended to Jews living in the Diaspora, and immigration to Israel increased after the war.

Other changes due to the war were in reference to the territories captured by Israel. In the Sinai Desert, there was some oil, and almost immediately after the war, there began to be trade between Israel and the Palestinians in Gaza and the West Bank, as IP became a customs union. Starting in 1968, Palestinians started to work in Israel, and by 1972, 27% of the Palestinians from the West Bank and Gaza who were working were working in Israel.[23] With these developments, the GDP in the West Bank and Gaza (WBG), which began to be estimated by Israel's Central Bureau of Statistics (ICBS), grew at an annual rate of 13.71% from 1968-1972.[24]

A second important effect on the economy from the war was France's decision to impose a weapons embargo on Israel. Prior to the war, France had been Israel's main supplier of arms, but in response to Israel's refusal to heed to French demands not to attack, France began a partial embargo on supplying French weapons to Israel and by January 1969, it became a complete embargo.[25] This caused Israel to turn to America for weapons, and to increase its own production of weapons. According to a report from the Director of Israel's Military Industries, by 1969, the number of workers working in Israel's military industries (5,000) doubled after the war, and production of military goods tripled.[26]

Despite or possibly because of the great Israeli success in the Six-Day War, the period afterwards was not peaceful unlike the period after the 1956 war. In October 1967, there began a war of attrition between Israel and Egypt, which continued until August 1970. The war was fought in the Sinai Desert and in Egypt and during this war, 400 Israelis were killed and more than 2,000 were wounded.[27] In addition, during this period, there began to be terrorists' attacks by the PLO in Israel, first from Jordan, and then after 1970 from Lebanon.

The next major war was the Yom Kippur War, which began on October 6, 1973 and continued through October 24, and involved Israel, Egypt and Syria. This war, which led to small changes in the borders, was particularly costly for all sides. 2,569 Israelis were killed and 7,251 were wounded, while Egypt and Syria lost 15,600 soldiers and approximately 35,000 were wounded.[28] These heavy losses caused Israel to lose its euphoria from the Six day War, and immigration to Israel declined, as from 1968-1972, the annual average of immigration was 43,169, while from 1974-1989, it was 21,501.

According to one estimate, each day of the war cost the Israeli economy 238 million US dollars.[29] Greenwald (1975, p.35) noted that the war "cost from half to two-thirds of the Israeli economy's entire output in 1973." In comparison, in the US in the 20th century, defense spending "peaked at around 50% of GDP in 1943 and 1944."[30] After the war, the Israeli government increased spending to replenish supplies, and taxes were raised to pay for these expenses. Greenwald (p.36) estimated that "Israelis became the most highly taxed people in the world, with an average tax rate of 43% of their income." However, at the same time, transfer payments were increased, at even faster rate than the increase in taxes, and hence net taxes as a percentage of GDP declined during the period 1974-1980 (14%) as opposed to 1968-1974 (19.9%).[31]

This increase in defense spending while net taxes were falling was made possible by aid from the US and borrowing. The result of the deficit financing was an inability to slow down inflation from the impact of the increase in the oil prices (see below), and inflation went out of control. In 1974, inflation was 56%, and while it fell in 1975, to 23%, it started to increase again peaking at an annual rate of 440% in 1984, before being stabilized (at 20%) in the second half of 1985.

The increase in government spending became the main driver of the economy in the 1970s and 1980s. According to Mintz and Ward (1987, p.523) in the middle of the 1980s:

> Investment in the defense sector accounted for as much as 50% of all industrial investment in Israel. Almost one-fourth of the industrial labor force in Israel is engaged in military related projects, about one-fourth of Israel's industrial exports (excluding diamonds) originate in the defense sector, and 8 of the 20 largest corporations in Israel are highly dependent on military contracting.[32]

Israel's economic growth began to slow down after the Yom Kippur War. From 1972-1980, the annual growth rate in Israel's GDP was 4.29%, from 1980-1985, it was 3.07% and from 1985-1989, it was 3.66%. This is much less than the annual growth of 11% from 1968-1972. Overall for the period from 1950-1972, the annual growth in GDP was 9.94%, while from 1972-2012, it was 4.11%. After the Yom Kippur War, Israel has never had the sustained levels of growth in GDP as it did in the period from 1950-1972. Accordingly, the war marked the end of the great economic growth in IP that had begun in 1922. From 1922-1972, the annual growth rate of per capita GDP in Mandatory Palestine and Israel was 6.41%, by far the highest in the world, and also the highest of any country for any continuous fifty year period in the 20th century.[33]

The Yom Kippur War also had a major effect on the world economy. In the midst of the war, on October 17th, the Arab oil ministers of OPEC announced an oil embargo to reduce production each month by 5%, and then on October 20th, Saudi Arabia, followed by the other Arab oil producers, cut off all shipments of oil to the

US in response to US aid to Israel ($2.2 billion). This embargo lasted until March 18, 1974, and caused oil prices and inflation to increase throughout the world.[34] Also, it is possible that the oil crises caused a change in the growth rate of economies throughout the world. Angus Maddison chose 1973 as one of his benchmark years, and according to his estimates, the annual growth rate of the world GDP from 1950-1973 was 4.9%, while from 1973-2003 it was 3.17%.[35]

With regard to the WBG, their GDP grew at an annual growth rate of 7.02% from 1972-1980, which while good, was less than the growth in the period from 1968-1972. Most likely, the decline was due to the lower growth in Israel's economy, but this decline was tempered somewhat by Palestinians working in the Persian Gulf, who benefited from the rise in the price of oil.

In 1978, Israel and Egypt agreed to peace agreement, and this ended the conflict between the two countries. However, at that time, a new war front developed between Israel and Lebanon that until then had been relatively peaceful. In March 1978, in response to a terrorist attack in Israel, Israel launched Operation Litani and invaded Lebanon. Israel pulled its forces out in June 1978, but then in June 1982, Israel again invaded Lebanon. In March 1985, Israel partially withdrew, leaving a "security zone" in Lebanon, and only in May 2000 did Israel fully withdraw all of its forces from Lebanon. Barkai (1986) estimated that both the direct and indirect economic costs of the war from June 1982 through March 1985 were five billion USD. These indirect costs include the restocking and repairs of army equipment, extra reserve duty of soldiers, present value of future medical and welfare costs, loss of feasible growth in GDP, and increase in debt servicing due to the direct expenses of the war.

Even after Israel's withdrawal in 2000, this front did not become completely peaceful and from July 12, 2006 through August 14, 2006, Israel fought an inconclusive war with Hezbollah in Lebanon. During this war, 154 Israelis, 1,600 Lebanese were killed, and 4,000 rockets landed in Israel.[36] This phase of the war appears to have had little effect on Israel's economy. Israel's GDP declined in the third quarter of 2006, (0.53%, seasonally adjusted, not annualized), but then it returned to its previous trend, and for the year 2006, Israel's GDP increased 5.8% an increase from 2005, where it increased 4.92%.

In 1987, there began a new development in the Arab-Israeli conflict. From May 1948 – December 1987, the conflict had been external, between Israel and its neighbors, but now it became internal within IP. During the period from June 1967 through December 1987, there had been protests and limited acts of violence in the WBG, but overall it was a peaceful period, with Israel having fewer than 2,000 soldiers in both areas.[37] In December 1987 there began an uprising (*intifada*), first in Gaza and then in the West Bank, against Israeli rule, which consisted of mass protests, strikes and throwing rocks and Molotov cocktails at Israelis. Israel responded by beatings, curfews, mass arrests, demolishing homes and economic measures. These economic measures included forcibly collecting taxes, and banning Palestinian villagers in the Jordan Valley from selling their produce in Jericho.[38] Due to the protests and Israeli responses, per capita GDP in the West Bank and Gaza declined three years in a row (1987, 1988, and 1989), -5.7%, -3.26% and -2.06%.[39] Israel also saw a downturn, partly due to the strikes by Arab workers and a reduction in tourism due to the violence.[40] In 1987, per capita GDP in Israel had increased 4.4%, the highest increase in Israel since 1972, but then in 1988 it rose just 1.87% and in 1989 it declined 0.3%.

There is no clear demarcation when the *intifada* ended. In 1990, there was a surge in immigrants (199,516) to Israel, mostly from the former Soviet Union, which created a demand for new housing, and this led to a huge increase in the GDP (21%) in the WBG since many of the Palestinians workers worked in construction in Israel. Thus, 1990 can be seen as the end of the *intifada*. Another possible ending was the signing of the Oslo Peace Accords in September 1993. With this latter definition, for the period from December 1987 – September 1993, 1,162 Palestinians and 162 Israelis were killed due to the *intifada*.[41] The Oslo Peace Accords included an economic annex, the Paris Protocols, which maintained the customs union that had previously existed.

The next major outbreak of violence was the second *intifada* which began in the end of September 2000 and here again it is not clear when this *intifada* ended. This *intifada* was much more violent than the first, and the number of fatalities peaked in 2002, with 420 Israelis and 1,032 Palestinians being killed.[42] In response to the *intifada*, in 2005 Israel withdrew all its forces and civilian population from Gaza.

The negative economic effects of this *intifada* were much stronger and more apparent than by the first *intifada*. People in Israel were afraid to go out to malls, restaurants and to use public transportation, tourism nose-dived, and Palestinians, especially from Gaza, lost their ability to work in Israel. For the first time in its history, Israel had two years of negative growth in GDP, -0.2% in 2001, and -0.1% in 2002, and the *intifada* a caused a crises with regard to the Israeli shekel in the first half of 2002.[43] For the Palestinians, the fall was much larger, as GDP declined 5.6% in 2000, 14.8% in 2001 and 10.1% in 2002.[44]

In June 2007, Hamas wrested control of Gaza from the Palestinian Authority, and this led to renewed tensions and violence between Israel and Gaza. The period with the most violence was from December 27, 2008 through January 19, 2009, when Israel launched a military incursion into Gaza. In this period, 1,398 Palestinians and

13 Israelis were killed, and there was extensive damage to buildings and infrastructure in Gaza.[45] However, according to data from the Palestinian Central Bureau of Statistics (www.pcbs.gov.pa) the fighting seems to have limited impact on the economy in Gaza. In 2008, GDP fell in Gaza, 6.09%, but this was less than the decline in 2007 (-8%), and in the following years, GDP increased rapidly, 8.45% in 2009, 11.86% in 2010 and 17.57% in 2011. In Israel, the economy was in a short recession at this time, but most likely this was due to the collapse of Lehman Brothers in September 2008 and not to this fighting.

II. Israel's defense spending

In addition to the immediate consequences of the wars, the conflict also had an impact on defense spending in the periods before and after the wars. Israel's Central Bureau of Statistics (ICBS, 2013) has compiled two measures of Israel's defense spending. One measure is called general government defense consumption expenditure, and ICBS reports annual data in constant prices (base year 2005) from 1955 through 2011. This measure includes payments by the defense establishment for wages, for purchases of goods and services, including imports though reducing sales by the Ministry of Defense. The second measure is total defense cost, and ICBS only reports this data annually starting from 2000. This measure includes the general government defense consumption expenditure plus imputation of the value of work performed by soldiers in compulsory service, additional payments by employers to supplement wages of employees doing reserve duty, expenditure for the storage of emergency stocks and investment in shelters. All these additions add approximately 20% to the cost of defense spending.

Table I presents the data for Israel's general government defense consumption expenditure in constant prices (2005), both overall and per capita and the percentage changes of each measure. Table II presents Israel's defense spending as a percentage of GDP and as a percentage of GDP excluding defense spending.

The data show that the war years, 1956, 1967 and 1973, had the largest increases in defense spending, 100%, 77% and 64% respectively. Other years where there were large increases were 1961 (29.6%), 1968 (23.2%), 1970 (38.6%) and 1987 (32.5%).[46] For the years, 1955-1966 (excluding 1956), defense spending as a percentage of GDP fluctuated between 9 and 12%. From 1967-1972, the ratio was higher than 20% each year, and after the Yom Kippur War, the ratio was higher than 30% in 1973, 1974 and 1975. 1975 was the peak year with defense spending equaling almost 35% of GDP and 53% of GDP excluding defense spending. In 1975, *The Economist* (Israel's other war, May 17, 1975), noted that "Israel's economy is still largely devoted to the war machine- perhaps more so than any other country in history. It has a population of only 3.4m, yet it has one of the 10 largest armies in the world, the sixth largest air force, a fast-expanding navy and over 2,000 tanks."

Since 1975, the trend has been for defense spending to fall, though until 1982, it was still higher than 20% of GDP. From 1995 onwards, defense spending as a percentage of GDP was under 10%, and in 2011 it was 6%, the lowest rate for all the years. In terms of absolute spending, from the peak of 65 million NIS in 1975, defense spending fell to 39 million NIS in 1995, and since then it has increased, reaching 51 million NIS in 2002 and 2011. On a per capita basis, the level in 2009 (6,521 NIS) was the lowest level since 1966. We see that with all the different measures, from 1955-2011, defense spending has been like a parabola, starting at relatively low levels, and then rising after the war in 1967, continuing to rise until 1975, and then falling.

It is possible that the defense spending spurred the development of Israel's high-tech sector since a significant part of the defense spending in Israel is for new technology to keep the army the most advanced as possible. In November 2012, Startup Genome, ranked the city of Tel Aviv, as having the second best startup ecosystem in the world after the Silicon Valley.[47] Many explain this outcome as a result of the education and experience that would-be high-tech entrepreneurs receive during their military training.[48] For example, *The Economist* (Israeli entrepreneurs: MBAs are for wusses, Aug 26th 2010) writes:

> Teenagers conscripted into high-tech units gain experience "akin to a bachelor's degree in computer science", says Ruvi Kitov, co-founder and chief executive of Tufin Technologies, an Israeli software firm. Almost all of Tufin's employees in the country are, like Mr Kitov himself, veterans of the Israel Defense Forces (IDF). One of the firm's cash cows is software that finds spam servers and blocks their transmissions. It is based on IDF cyberwarfare technologies that developers first used as soldiers.

This development is a positive externality due to defense spending, but there is also large negative externality to Israel's economy from the conflict that is unique to Israel. There are a group of Jews (they are commonly referred to as Ultra-Orthodox or Haredim) who refuse to enlist in the army for religious reasons, and they have been excused from being drafted on the condition that they study in a *yeshiva* (school where one studies Jewish texts). This condition means that they cannot enter the workforce since they have to remain in *yeshiva* to retain their draft exemption. This exemption was initially given to 400 men, but starting 1977, it grew explosively and in 2009, there were 54,300 men (14% of eligible conscripts) between the ages of 18 and 34 who were exempt from serving in the army since they were studying in a *yeshiva*.[49] This large number of people who are not working places a large burden on the Israeli economy in terms of lost production and welfare payments to support these men.

It is very hard to quantify these two externalities, but researchers have attempted to test whether there is a relationship between the measurable defense spending and economic growth in Israel. Benoit (1973, 1978) argued that there is exists a positive relationship between military spending and economic growth for less developed countries, but Dunne (2012) in a brief review of surveys of this question, notes that most studies have found either no effect or a negative effect, while only a smaller number of studies found a positive effect. Dunne (2012, p.556) concludes in his study "the results here do imply that there is little or no evidence for a positive effect on economic growth and that it is more likely to have a negative effect, or at best no significant impact at all."

With regard to Israel, Cohen, Stevenson, Mintz and Ward (1996, p.343) note "the overall conclusion of previous empirical analyses is that the direct linkages between changes in defense spending and changes in economic growth in Israel are very weak, indeed." In their study of data from 1960-1992, they found (p.347)

> On the one hand we find that the impact of changes in military spending in Israel on output is insignificant regardless of whether one models these relationships based on a neo-classical production function approach or via the labor component in the indirect link model. On the other hand, there are significant effects of military spending on growth via the investment path.

This investment path is an attempt to incorporate the positive externality of military spending on labor productivity and technological change. On the other hand, DeRouen (2000) also attempted to include the positive effects of technology from military spending, but according to his results (data from 1952-1992) there was a negative relationship between military spending and economic growth, though the coefficient was only significant at a 90% confidence level.

Looking at the issue from a different perspective, Abu-Bader and Abu-Qarn (2003, data from 1967-1998) used Granger causality tests to argue that an increase in Israel's military spending reduces economic growth in Israel. However, Dunne and Smith (2010) argue that one should be wary about the results from Granger causality tests by military expenditure since the tests are sensitive to many econometric specifications that can potentially alter the interpretation of the results.

In view of the inconclusive results from the econometric tests, both in general and with regard to Israel, and because we are interested in the relationship between the Arab-Israeli conflict and not *per se* defense spending, we will use a case study approach to assess why in some instance the wars in IP increased economic growth and in some cases decreased economic growth.

III. Conclusion

Our case study approach has a two stage framework. The first stage is to examine the immediate changes in physical capital and production in the economy during the war. The second stage is to examine the change (if any) in the economic environment that resulted from the war. In this analysis, without being hard headed, we will ignore all the terrible human suffering that occurs from wars, and the two externalities discussed above, but we will include the effects of defense spending.

The first war was WWI, and in this war, there were large losses in the physical capital of the country and no gains in production due to the war. However, the change in the economic environment due to the war was very significant. The British invested in the infrastructure of the country and their rule was one of inclusive institutions, much more than in the previous Ottoman period.[50] Accordingly, British rule fostered economic growth, and then a long run perspective changes one's evaluation of WWI from being negative due to the immediate effects of the war to being positive due to the benefits from British rule.

The next war was the Arab revolt, and here there was no change in the economic environment after the war. In this war, the major loss was due to the disruptions in the business system in the country, which caused trade within the country and investment to fall, and as there was no major increase in production (just British forts) due to the war, we can categorize this war as having a negative effect on IP's economy.

The next war was WWII, and here there were almost no losses to the physical capital of the country and there were no changes in the economic environment after the war. However, there were increases in production due to the war, and it is likely that the skills and knowledge acquired during the war increased IP's industry even after the war. Overall, WWII had a positive benefit to IP's economy.

The next war was by the founding of the state of Israel. With this war, one must split the economic effects of the war between the Arab and Jewish residents of IP. With regard to the Arabs, this war was extremely negative economically from both an immediate and a long run perspective. Already during the first part of the war, the civil war between November 1947 and May 1948, the Arab economic system was collapsing, and the war led to a large change in the economic environment of all the

Arabs who lost their homes and fields. With regard to the Jewish residents, while there were some losses in physical capital, these were replaced after the war, and there was some increase in production due to the war. On the other hand, there were major changes in the economic environment after the war, with the imposition of the Arab boycott, massive Jewish immigration, and the change in government from the capitalist inclined British to the socialist Israeli government. The effect of these changes in the economic environment is difficult to determine, but in light of the excellent growth in per capita GNP from 1949-1951, we can say that the war had a positive immediate effect on the economy of the Jewish residents of IP.

The next war was in 1956, the Sinai campaign. This war did not cause any losses in physical capital in Israel, but it did lead to losses in production due to the extended call up of reserves. These were relatively minor and short term-losses. With regard to the change in the economic environment, Israel was able to use the port in Eilat, which was a positive development. Most likely, from a long-run perspective this gain was greater than the immediate losses in production, but as the port of Eilat never became a major port in Israel, the positive effects of the war in 1956 were limited.

The next war was the Six Day War. In this war there were almost no losses in physical capital or in production, and instead the economic effects of the war all relate to the change in the economic environment. These changes all seem to have been positive for IP's economy. The increase in defense spending when there was high unemployment prior to the war was a fiscal stimulant to the economy. The opening of trade and freedom of movement between Israel and the WBG lifted the economies both in Israel and the WBG. Even the French embargo can be viewed positively since it led to an increase in military production, which later trickled down to the civilian high-tech sector.

The next war was the Yom Kippur War, and here the losses to physical capital were huge and there were no increases in production during the war. With regard to economic environment after the war, there was an even greater increase in defense spending in Israel, but this time the economy was close to full employment, and with no increase in net taxes, this contributed to very high levels of inflation. In addition, while the high defense spending increased GDP, albeit at a smaller rate than before, it is not clear if the defense spending crowded out other investment, or whether had there been no increase in defense spending, the growth rate would have been even less. This question is dependent on the general question of whether military spending has a positive or negative effect on the economy. In Israel's case after the Yom Kippur War, did the growth rate of GDP decline due to the military spending, the increase in oil prices due to the war, the reduction in immigration due to the war or was it completely independent of the war as the decline in the growth rate might have been due to the stifling effect of the socialist policies of the Israeli government. Accordingly, while it is most likely that the war had a negative impact on the economy, there remains the possibility that the increase in defense spending due to the war boosted the economy.

The next war in the conflict was the set of wars between Israel and Lebanon, and due to the extended nature of the war, there were losses in foregone production, but there were few losses to IP's physical capital and no changes in the economic environment. Overall the war had a limited but negative effect on Israel's economy.

The next set of wars was the two *intifadas*, and these led to large losses due to the disruptions to the business systems of Israel and WBG. The changes in the economic environment were that Israel limited Palestinians from working in Israel, and trade between Gaza and Israel was drastically curtailed, especially after Hamas attained control of Gaza. With regard to the economies in the WBG, both effects impacted negatively on their economies. It is possible that the disruption in trade will cause Palestinians to develop an economy independent of Israel, which would be a positive effect, but this has not yet happened. With regard to Israel, the changes in the economic environment were smaller since the economies in the WBG were more dependent on Israel than Israel was on them, and hence the major loss to Israel's economy was during the *intifada* itself.

This review shows that there is no one conclusive effect of the wars in IP on the economy. In some cases, wars were beneficial to the economy, as in IP in WWII, and the Six Day War. On the other hand, the Arab revolt in 1936-1939, the war in 1947/48 for the Arab residents of IP, the war in Lebanon, and the two *intifadas* had negative effects on the economy in IP. Finally, in some cases, calculating the economic consequences of a war is unclear, either due to the relatively small effects of the war, as in 1956, or due to the inability to accurately assess the long run changes in the economic environment, as by the war in 1947/48 for the Jewish residents of IP and the Yom Kippur War.

Even though there exists this level of indeterminacy, still two generalizations, which admittedly are not novel, can be suggested from this review of the wars in IP since 1914. One, the most important economic consequence of wars is the change in the economic environment from the war, but these changes are not easy to quantify and sometimes they are difficult to even determine and identify. A corollary of this first generalization is that losses to physical capital, which can be replaced, have no long run effect on the economy. An example of this generalization and its corollary would be WWI in IP. Two, internal or civil wars, such as the *intifadas* and the Arab Revolt, where the losses are due to the economy ceasing to function for an extended period, are much more destructive to economies than losses to physical capital.

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Table I

Data in New Israeli Shekels (NIS), constant prices 2005

Year	General Government Defense Consumption Expenditure	Percentage change	Per capita	Percentage change
1955	3,265,700,000		1,866	
1956	6,531,300,000	100.00	3,572	91.47
1957	4,465,700,000	-31.63	2,313	-35.24
1958	4,524,700,000	1.32	2,262	-2.21
1959	4,628,100,000	2.29	2,244	-0.79
1960	5,083,400,000	9.84	2,401	6.99
1961	6,585,800,000	29.56	3,007	25.24
1962	7,511,900,000	14.06	3,283	9.16
1963	8,880,500,000	18.22	3,732	13.67
1964	8,664,400,000	-2.43	3,497	-6.28
1965	9,743,400,000	12.45	3,802	8.72
1966	11,027,500,000	13.18	4,194	10.31
1967	19,465,300,000	76.52	7,169	70.93
1968	21,623,300,000	11.09	7,705	7.47
1969	26,644,700,000	23.22	9,238	19.90
1970	36,925,700,000	38.59	12,416	34.40
1971	36,848,800,000	-0.21	12,006	-3.31
1972	34,764,900,000	-5.66	10,958	-8.73
1973	56,995,800,000	63.95	17,387	58.67
1974	58,326,100,000	2.33	17,270	-0.67
1975	65,385,200,000	12.10	18,923	9.58
1976	56,038,700,000	-14.29	15,862	-16.18
1977	45,177,300,000	-19.38	12,504	-21.17
1978	49,595,200,000	9.78	13,431	7.41
1979	42,922.300,000	-13.45	11,336	-15.60
1980	49,169,100,000	14.55	12,680	11.86
1981	53,952,500,000	9.73	13,665	7.77
1982	47,194,900,000	-12.53	11,720	-14.23
1983	42,569,400,000	-9.80	10,443	-10.90
1984	46,265,000,000	8.68	11,124	6.52
1985	49,737,600,000	7.51	11,750	5.63
1986	40,782,700,000	-18.00	9,487	-19.26
1987	54,054,000,000	32.54	12,372	30.41
1988	49,576,100,000	-8.28	11,162	-9.79
1989	39,356,300,000	-20.61	8,711	-21.96
1990	43,503,200,000	10.54	9,335	7.17
1991	44,786,400,000	2.95	9,049	-3.06
1992	42,436,400,000	-5.25	8,283	-8.47
1993	45,503,800,000	7.23	8,649	4.42
1994	40,488,400,000	-11.02	7,499	-13.29
1995	38,463,000,000	-5.00	6,937	-7.50
1996	41,090,100,000	6.83	7,228	4.20
1997	41,529,300,000	1.07	7,125	-1.42
1998	42,500,700,000	2.34	7,118	-0.09
1999	43,540,700,000	2.45	7,108	-0.14
2000	43,977,000,000	1.00	6,992	-1.63
2001	45,739,000,000	4.01	7,103	1.59
2002	51,011,400,000	11.53	7,764	9.30
2003	47,861,900,000	-6.17	7,155	-7.85
2004	44,914,800,000	-6.16	6,596	-7.80
2005	45,739,000,000	1.84	6,600	0.06
2006	48,537,000,000	6.12	6,881	4.26
2007	48,723,900,000	0.39	6,786	-1.38
2008	49,512,100,000	1.62	6,774	-0.17
2009	48,810,500,000	-1.42	6,521	-3.75
2010	49,962,100,000	2.36	6,554	0.51
2011	50,785,300,000	1.65	6,540	-0.21

Table II

Data in New Israeli Shekels (NIS), constant prices 2005

Year	Defense Expenditure as a percentage of GDP	Percentage change	Defense Expenditure as a percentage of GDP excluding military spending	Percentage change
1955	0.088		0.097	
1956	0.162	46.82	0.194	99.83
1957	0.102	-21.78	0.114	-41.40
1958	0.096	-2.78	0.107	-6.19
1959	0.087	-3.03	0.096	-10.17
1960	0.090	3.53	0.099	3.33
1961	0.105	11.56	0.117	18.80
1962	0.109	3.39	0.122	4.16
1963	0.117	6.39	0.132	7.87
1964	0.105	-3.70	0.117	-11.28
1965	0.108	0.93	0.121	3.12
1966	0.121	3.33	0.137	13.71
1967	0.208	32.17	0.263	91.62
1968	0.201	2.18	0.251	-4.65
1969	0.219	6.39	0.281	11.94
1970	0.282	11.30	0.393	40.00
1971	0.253	-2.72	0.339	-13.81
1972	0.213	-4.94	0.270	-20.25
1973	0.333	16.59	0.498	84.41
1974	0.323	-0.59	0.476	-4.45
1975	0.348	1.77	0.534	12.22
1976	0.294	-6.90	0.416	-22.13
1977	0.232	-9.06	0.302	-27.33
1978	0.245	1.87	0.324	7.21
1979	0.202	-7.20	0.254	-21.76
1980	0.224	6.40	0.288	13.68
1981	0.234	3.05	0.306	6.24
1982	0.202	-6.45	0.254	-17.24
1983	0.178	-5.46	0.216	-14.69
1984	0.189	2.68	0.233	7.81
1985	0.195	3.73	0.242	3.63
1986	0.154	-9.17	0.182	-24.61
1987	0.192	12.17	0.238	30.79
1988	0.170	-5.89	0.205	-13.79
1989	0.133	-12.60	0.154	-25.07
1990	0.138	2.73	0.160	4.25
1991	0.134	-1.56	0.155	-3.42
1992	0.119	-6.75	0.135	-13.13
1993	0.123	2.91	0.140	3.80
1994	0.102	-10.73	0.114	-18.76
1995	0.091	-4.03	0.100	-11.91
1996	0.092	1.69	0.101	1.46
1997	0.090	-1.50	0.099	-2.25
1998	0.089	-0.07	0.097	-2.01
1999	0.088	-0.23	0.096	-0.90
2000	0.082	-0.53	0.089	-7.67
2001	0.085	0.25	0.093	4.59
2002	0.095	6.10	0.105	12.82
2003	0.088	-3.80	0.096	-8.26
2004	0.079	-4.47	0.085	-11.44
2005	0.076	0.16	0.083	-3.18
2006	0.076	3.00	0.083	0.33
2007	0.072	-2.51	0.077	-6.59
2008	0.070	-1.12	0.075	-2.92
2009	0.068	-4.35	0.073	-2.82
2010	0.066	-0.91	0.071	-3.35
2011	0.064	-0.86	0.068	-2.99

[1] Karlinsky (2005) p.110.

[2] Stein (1987) p. 38.

[3] Giladi and Naor, (2002) p.458.

[4] Smilansky (1959, Book four, p. 31).

[5] Biger (1994).

[6] Rogan (2009) p. 205.

[7] Morris (2008) pp. 16-21.

[8] Metzer (1998), pp. 221, 231

[9] Gross and Metzer (1993).

[10] *The Economist*, The Haifa Refinery, May 29, 1948, p.895.

[11] Morris (2008) pp.39, 73.

[12] Morris, (2008), p.406.

[13] *The Economist*, "Oil Companies Dilemma," August 14, 1948, p.259, and *The Economist*, "Shorter notes," September 2, 1950, p.438.

[14] Sacher (1976) p.450.

[15] Bregman (2010), p.59.

[16] Rubner (1960), p.29, and Ziv (1958) p.364.

[17] All data on Israel's GDP from ICBS, Statistical Abstract of Israel 2013.

[18] Kanovsky (1970) p.54.

[19] Lasker (1995).

[20] Ben-Porath (1986), and data on immigration from ICBS Statistical Abstract.

[21] Sacher (1976) p.658.

[22] Kanovsky (1970) p.72.

[23] ICBS, Statistical Abstract of Israel 1975, pp. 699, 700 and 706.

[24] See Schein (2013) for a full discussion of the growth in the economies in the West Bank and Gaza from 1950-2005. All data concerning GDP growth in the West Bank and Gaza in this paper is from this source unless otherwise stated.

[25] For a discussion of French - Israeli relations up to 1967, see Heinmann (2010).

[26] Kanovsky (1970) p.50.

[27] Bregman, (2010), pp.95-101.

[28] Bregman (2010) p.142.

[29] Van Creveld (2010) p.151.

[30] Dunne and Smith (2010) p.429.

[31] Berglas (1986) p. 187.

[32] In comparison, in 2012, of the ten largest Israeli exporters, whose exports consisted of 48% of Israel's exports of goods (excluding diamonds), two produced military equipment, see Cohen 2013.

[33] Schein (2007) p.316.

[34] Yergin (1992) pp.606-632.

[35] Maddison (2007) p. 380.

[36] Bregman (2010) p.291, and Rogan (2009) p. 494.

[37] Van Creveld (2010) p.240.

[38] Bregman (2010) pp. 196-198.

[39] Schein (2013).

[40] Rabin (1988) and Kifner (1989).

[41] Bregman (2010) p.200.

[42] Data from the organization B'Tselem, www.btselem.org.

[43] See Schein (2003) and Schein (2012) for detailed analysis of the effect of the *intifada* on the Israeli economy and on the value of the shekel.

[44] Data from World Bank, www.worldbank.org.

[45] Data from B'Tselem.

[46] 1987 was the beginning of the *intifada*, but the large increase in defense spending 1987 could not have been due to the *intifada* since it began in December.

[47] http://techcrunch.com/2012/11/20/startup-genome-ranks-the-worlds-top-startup-ecosystems-silicon-valley-tel-aviv-l-a-lead-the-way/

[48] For a popular discussion of the development of Israel's high-tech sector and its connection with the military, see Senor and Singer (2009).

[49] Bick (2010) p.302.

[50] See Schein (2012).